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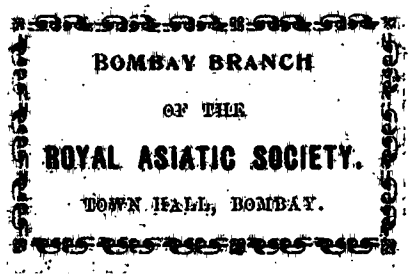

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ILLUSTRATIONS

OF

EXOTIC ENTOMOLOGY,

CONTAINING

UPWARDS OF SIX HUNDRED AND FIFTY

FIGURES AND DESCRIPTIONS

OF

FOREIGN INSECTS,

87976
oc.

INTERSPERSED WITH

REMARKS AND REFLECTIONS ON THEIR NATURE AND PROPERTIES.

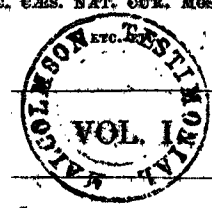
BY DRU DRURY.

A NEW EDITION,

BROUGHT DOWN TO THE PRESENT STATE OF THE SCIENCE,
WITH THE SYSTEMATIC CHARACTERS OF EACH SPECIES, SYNONYMS, INDEXES,
AND OTHER ADDITIONAL MATTER.

BY J. O. WESTWOOD, F.L.S.

SOC. ENTS. NAT. CUR. MOSQ. SOC.



VOL. I.

LONDON:

HENRY G. BOHN, 4, YORK STREET, COVENT GARDEN.

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PREFACE

TO THE PRESENT EDITION.

THE acknowledged value of the figures contained in Drury's "Illustrations,"* the extreme rarity of many of the insects figured therein, which continue up to the present day to be unique, and the scarcity of the work itself, which appears almost unknown to Continental Entomologists, having induced the proprietor of the plates to republish the work, I have consented to undertake the charge of bringing it forth in a form more adapted to the present greatly advanced state of Entomology. How far I have succeeded must be left for the candid Entomologist to decide. It is fit however that, by way of bespeaking indulgence for the numerous errors into which I fear that I have, notwithstanding all my care, fallen, I should mention the obstacles which have operated against my giving the work that perfect style which I could have wished it to possess. Of these the chief difficulty has arisen from the non-possession of the specimens which served for the original illustrations, without which it may be readily conceived that it has been impossible to ascertain with precision many of the more minute characters, of which the present state of the science requires the investigation; thus in many cases I have been obliged to remain in ignorance of the particular structure of the antennæ, trophi and legs, and the disposition of the veins of the wings, in many of the smaller species of Lepidoptera, so that the precise genera may not in some instances be correctly stated; and to many I have been compelled to attach marks of interrogation for the like reason. Another and equally strong obstacle has been produced from the little attention paid to exotic

* The original title of this work, Vol. I., was "Illustrations of Natural History, wherein are exhibited upwards of two hundred and forty figures of EXOTIC INSECTS, according to their different genera, very few of which have hitherto been figured by any author, being engraved and coloured from nature, with the greatest accuracy, and under the author's own inspection; on fifty copper-plates; with a particular description of each Insect, interspersed with remarks and reflections on the nature and properties of many of them, by D. Drury, 1770." The second volume containing upwards of two hundred and twenty figures, on fifty copper-plates, appeared in 1773; and the third containing upwards of two hundred figures, also on fifty plates, was not published until 1782. The majority of the plates were drawn and engraved by the celebrated Moses Harris, but some of the plates in the last volume were by a different hand.

Lepidoptera by modern Entomologists. More than two-thirds of these Illustrations are illustrative of that beautiful order of insects; and yet, with the exception of some of the showy butterflies and moths, scarcely a reference is to be found even in the works of Fabricius, the personal friend of Drury, whose Entomologia Systematica, published in 1793 and 1794, contains the last general summary of the species of this order; Gmelin also, whose Systema Naturæ it has been the fashion to decry, but which, as a laborious compilation from the works of preceding and chiefly Continental authors, is of great service,* was only acquainted with these illustrations through the early works of Fabricius.† It is true that M. M. Boisduval and Guérin have respectively published various new exotic Lepidoptera, especially of the Nocturnal group, in the Voyages of the Coquille and Astrolabe; but we still want a general revision, not only of the species but of the genera of this order. It was to have been hoped that, as regarded the Javanese species, this would have been effected by Dr. Horsfield, whose work upon the Lepidoptera of Java, as far as published, leaves nothing to be desired of the structural details of the species illustrated therein. M. Boisduval also, in his Histoire Naturelle des Lépidoptères, has treated the subject in a masterly manner, availing himself both of the preparatory states and veining of the wings; but we greatly miss those beautiful details which render the works of Horsfield and Curtis invaluable. It is in this comparative ignorance, both of the structural and metamorphotic details of exotic Lepidoptera, that we may attribute the want of a sound and philosophical distribution of the order in question; and which at the same time prevents us from determining the situation of many remarkable and anomalous groups. Of these the genera Castnia, Urania, &c. and the whole tribe of the Zygænidæ may especially be mentioned; and it is with the view of inciting enquiry into this part of the subject, that I have introduced many of the latter species into the genus Callimorpha amongst the Nocturnal moths.

Another obstacle has been produced by the little attention paid by the Entomologists of the last century to the geographical situation of their insects; as an instance of this, it will be sufficient to mention that Linnæus and Fabricius made use of the term "In Indiis" generally, to indicate that an insect was an inhabitant either of the West or East Indies. Drury indeed appears to have paid more than the ordinary degree of attention to this part of the subject, as appears from the Catalogue of his Insects, which I obtained at the sale of Mr. Donovan's collections, to whom, as appears by a note, they were presented by Mr. Drury. Thus under Lucanus interruptus, (Genus Passalus, Fabricius,) we find the following entries:—

* A similar compilation bringing down the science to the present time would be invaluable, even with all the inaccuracies charged to Gmelin.

† This is evident from Gmelin's occasionally copying some of Fabricius' erroneous references, e. g. Bombyx ornatrix, Gmel. p. 2444. with a reference to Drury, v. 1. t. 74. as in Fabr. Syst. Ent. p. 586. instead of tab. 24.

7.	3.	Interruptus,	Muskito Shore,	Capt. Keay, } also at Maryland, New York, Caro-
8.	3.	Interruptus,	Sierra Leone,	Mr. Smeathman, } lina, where they are very large.
9.	3.	Interruptus,	Maryland,	Mr. Milward, 1756, Lin. Syst. p. 560, f. 4.
10.	4.	Interrupt. var.	Rio Janeiro,	Mr. Bonifas, 1775, that on the right hand from Mr. Laing, at Tobago.
12.		Interrupt. var.	. . . . .	Bought at Seymour's sale.

Here it is quite evident that Drury had carefully noted down the localities of all the specimens of this insect which he possessed, and which are now described as distinct species; and this extract will I think be quite sufficient to shew, that from the careful manner in which these Catalogues were kept by Mr. Drury, we are entitled to regard them, when there happens to be a difference between the works of Drury and Fabricius, Linnæus, &c. as at least of equal authority with the writings of these authors. I regret that these Catalogues did not come into my hands until after the first and second volumes of this edition were printed off. I have incorporated the notes in the third volume; and have given, as an Appendix, extracts from these Catalogues, where there happens to be any variation or doubt as to the locality of any of the species figured in the first two volumes.

I have almost invariably adopted the very proper principle of referring to that name, either generic or specific, which has the priority in point of date. In the first edition, the first volume appeared without specific names, which were at that time a novelty but recently introduced by Linnæus. In the second volume, however, an appendix was given, containing specific names both of the first and second volumes, and a similar appendix was given at the end of the third volume; but no specific names appeared in the body of the work. To many of the names contained in the appendices Fabricius referred, many he entirely omitted, and for many he substituted others. These last I have of course rejected; and have in many instances given the dates when the names were first imposed by the different authors—a plan which would be very serviceable if generally adopted. I have, likewise, made a point in many cases of restoring the specific *proper* names, where, in consequence of a change in the sex of the generic name, a corresponding change had been made in such specific name. This alteration had been carried to a great extent in the Encyclopédie Méthodique; and many male and female *proper* names had been completely altered, in order to suit them to the sex of the new genera in which they were placed. This was, however, an error on the wrong side; because it is admitted as an established principle, that if it should be thought necessary to subdivide a genus, the names of the subdivisions should be of the sex of the original generic name.

The plan upon which the first edition of this work was published may be seen from the following specimen, which is one of the shortest given, but which will be sufficient to shew not only the style of the former edition, but also the manner in which I have treated the subject and the additions which I have introduced.

Vol. I. Plate 11.

Fig. III.—Expands about three inches.

Upper Side.—The antennæ are black. The head, thorax, and abdomen brown. All the wings (the edges of which are even not dentated) are of a deep brown, with a shade of clay colour, rising near the anterior edges of the superior ones, runs along near the tips and ends at the external edges.

Under Side.—The eyes are black, the palpi yellow. All the wings are the same brown colour as the upper side, with the clay-coloured shade near the tips as on that. The superior wings have five whitish spots on each placed on a row near the external edges, the inferior ones have on each sometimes five and sometimes seven spots of the same colour placed in a circular row, that meets near the extremity of the body.

I received it from China. I cannot find it any where described.

Fig. III.—Il deploye ses aîles environ trois pouces.

Le Dessus.—Les antennes sont noires. La tête le corcelet et l'abdomen bruns. Les aîles (dont les bords sont unis ou point dentélés) sont d'une couleur brune foucée, avec une nuance couleur d'argille se levant proche des bords antérieurs des aîles supérieures, qui court le long près des bouts et finit aux bords extérieurs.

Le Dessous.—Les yeux sont noires, les antennules jaunes. Toutes les aîles sont de la même couleur brune que en dessus, avec la nuance d'argille proche des bouts chacune des aîles supérieures a cinq taches blanchâtres, placées sur une ligne près des bords extérieurs. Les inférieures ont chacune quelquefois cinq et quelquefois sept taches de la même couleur rangées circulairment et se rencontrant près de l'extrémité du corps.

Il l'ai reçue de la Chine. Je ne le trouve point décrît.

The name of Papilio Eumeus was consequently proposed for this insect in the Appendix to the second volume.

Amongst the manuscripts with which I have been favoured by the relatives of Mr. Drury, or have obtained elsewhere, are comprised a variety of notes relative to the publication of this work, and of observations from which the following are selected. He notices that "his *descriptions* are only intended to assist the reader in ascertaining the different species; and that they are not intended to be so complete as to give a perfect idea of the animal without the help of the figure." He alludes to the difficulty not only "of ascertaining true colours or calling them by their proper names," but also of "colouring the prints so, as to exactly represent the natural specimens,"—that he has mentioned and given English names to no more parts of insects than had suited his purpose for describing them,—that "there are some parts mentioned in the descriptions which cannot be seen in the plates, such as the Gorget (Sternum), &c. which may serve not only to assist in classing them, but to ascertain their species." "The descriptions of the Hymenoptera are not intended to be so complete as to give a perfect idea of the insect, but are only given to assist the reader in observing the figures."

"All the descriptions are taken from the insects themselves; whatever defects, therefore, are to be observed in comparing them with the coloured figures must be imputed to the artist, as it would not be proper to describe them according to the prints, but to nature."—

It is in consequence of this last remark that I have been careful to omit nothing of the original edition in this edition of the least importance, but have given the description as much as possible in the words of the author himself.

I have also added a general Systematic Index to the entire work, and an Alphabetic Index, in which the names employed in the first edition are distinguished by an asterisk.

The collection formed by Drury was exceedingly choice, and had occupied nearly thirty years in its formation; for although, as Drury himself says (in one of the printed circulars which he distributed with a view to its sale) "there may be in Holland collections more numerous, having in many instances a great number of a single species) yet no collection abounds with such a wonderful variety in all the different genera as this. All the specimens of which it is composed, are in the highest and most exquisite state of preservation, such an extensive collection can be supposed to be, and a very considerable number are *unique*, such as are not to be found in any other Cabinet whatever, and of considerable value; many of which, coming from countries exceedingly unhealthy, where the collectors, in procuring them, have perished by the severity of the climate, give but little room to expect any duplicate will ever be obtained during the present age; and the learned quotations that have been taken from it by those celebrated authors Linnæus and Fabricius, in all their late editions, are incontestable proofs of the high degrees of estimation they entertained of it."

This statement was made in 1788, when the author had consumed upwards of twenty-five years in its formation, and at which period no less a sum than £4,000. had been expended upon the collection. At this period the collection consisted of—

	Subjects.	Different Species.
Coleoptera	2218	2136
Hemiptera	895	778
Lepidoptera	2462	2148
Neuroptera	172	171
Hymenoptera	533	533
Diptera	552	402
Aptera	105	96
English Collection	2641	2070
	9578	8370

Subsequently great additions were made to the collection, which, as will be seen from the localities affixed to the species figured in these Illustrations was received from all parts of the world with which England at that period had intercourse. Of the earnest zeal with which this collection was made, an idea may be obtained from a copy of a letter addressed to a gentleman residing in Africa, with whom he was anxious to enter into correspondence.

SIR, *London, Dec. 13th*, 1766.

MY being an utter stranger to you compels me to apologize for the liberty I take in sending you this. Mr. Carghill's recommendation is the occasion of my doing so, and he has assured me of your

kind disposition to oblige me in those articles that are the subject of the following lines; I must therefore inform you that I am engaged in the study of Natural History, but as the extensiveness of it in all its several parts is very great, I confine myself entirely to one single branch, and that is Insects. A branch I find fully sufficient to engage my attention without entering into any of the others, and in consequence of this I am endeavouring to obtain as large a collection of foreign ones as I possibly can; to this end I am under a necessity of getting various recommendations from my friends to gentlemen settled in foreign parts, who I must consider as the only persons that can effectually assist me in this scheme. Permit me therefore, Sir, to beg your concurrence herein, and if the highest ideas of gratitude can prompt a man to make an adequate return for any favour of this kind, be assured I shall take the earliest opportunity of manifesting mine for any thing you shall think proper to oblige me with. The great distance the continent of Africa is situated from London, the ignorance we labour under of its produce in the insect world, and the great difficulty I have found in procuring any insects from those parts, are circumstances that rather increase than blunt my desire for them; but as in the course of fourteen years I have not been able to procure any great number, I can only attribute this disappointment to my having never been able to apply to any gentleman settled there, for the persons that I have hitherto commissioned to this purpose were those that returned with the ships they went in, and I imagine their time was too short to be able to procure such things for me; but as Mr. Carghill has informed me your residence in Africa will afford you many leisure hours, permit me to indulge the hope of your complying with this request. It is necessary for me to inform you that there is no occasion for your bestowing any time of your own in this pursuit, as I imagine it might be done by people to be hired in Africa to that purpose for a very trifle; and as it is necessary I should inform you where and in what manner insects in general are to be taken, give me leave therefore to explain the use of the things I have sent for that purpose: you will observe the bows of the forceps being covered with gauze, and folding so close together as to prevent any small insect's getting out when once enclosed, constitutes a contrivance the best adapted of any thing I ever saw for that purpose, it is small enough to be carried in the pocket, and if you have curiosity enough to employ an hour in this amusement, permit me to say you will have a scene of wonders opened to you in the insect world, you will have such a number of objects of speculation present themselves, that will amaze you. When an insect is inclosed in these nets it is to be stuck through the body with a pin (I have sent some for this purpose), and in that manner placed in the box, whose top and bottom are lined with cork. Suffer me to beg of you (if you will be so obliging to procure me some of those things) to get a larger box made in Africa of soft wood, in which a pin will easily enter, and replace the insects out of the oval box now sent into that, and when filled I will entreat you to commit it to the care of a friend to be conveyed to England, giving him at the same time a charge to keep it from being tumbled about by the rolling of the ship, which will certainly damage the contents, and favouring me with a letter of advice; it is necessary to beg you to paste a slip of fine linen or paper all round the crevice and opening of the box, to prevent the cockroaches, ants, &c. getting in, who will infallibly damage and destroy the insects in it; I forgot to mention that they should not be removed out of the oval box into the great one till they are dead, because they will scratch and tear one another to pieces, therefore when the person comes home from collecting, they may be taken out singly and stuck on a piece of board or stick, and held close to the fire (not so as to burn or scorch them), and this in less than a minute will effectually kill them, afterwards they may be stuck very close together in the large box, and in that manner sent to England. I will just mention what kinds will be most acceptable, and where they are to be found, viz. beetles or insects with hard cased wings, insects with transparent wings, such as wasps,

bees, waterflies, also locusts or grasshoppers, ants, fireflies, or in short any kind except cockroaches, centipes, or scorpions, which in general are so very common they cease to be valuable—of all the other kinds there is an infinite variety, differing in size, shape, and colour, any of which will be very acceptable, either large or small; and of which, give me leave to observe, the most ugly disagreeable insects (as they appear to be) are the most desirable. They are found in various places, some on flowers, some in horse-dung or cow-dung, some under stones and logs of wood, some under the bark of trees where it separates or divides itself from the body, which by tearing up will expose many kinds to view; but no place abounds more than rotten trees, for there they hide and secrete themselves in holes among the rotten wood, and are never seen unless they are searched for. Let me here observe, that the different seasons will yield different species of insects, some being to be found in one week that were not to be seen the preceding ones, and the next will afford others differing from the former, while the succeeding one shall produce some other sorts that were not to be seen before; so that by searching for them at different times, you perceive great varieties will be collected. I must also beg you to preserve the horns of them as much as possible, as they in a great measure determine their genus, and as such should not be broke off. The insects placed in the box will serve as samples to shew the person you may hire what kinds of things are meant to be collected, who for want of them might not be able to understand your instructions.

I have now, Sir, mentioned every article necessary to be known, therefore shall conclude, with once more begging you to assist me in this scheme; and if there is any business, or any other thing, in which I can be serviceable to you here, I beg you would command me; but if there is nothing of that kind by which I can express my gratitude, permit me again to repeat I shall take the first opportunity of making a return fully adequate to your favour.

I am, Sir, with great respect, your most obedient servant,

D. Drury,
At No. 1. in Love Lane, Aldermanbury,
London.

P. S. I forgot to mention that when you employ an agent to collect insects, please to tell him it is not the great number but the variety that I desire, six or eight being enough of any one species.

Subsequently, this fine collection came to the hammer, on Thursday, May 23, 1805, and the two following days. A few of the more interesting lots, with the prices obtained for them, and the names of the purchasers, are given below as an interesting record.

Lot 3	Phalæna Aprilina, Graminis, and 22 others.....	26	.....	£7	12	0 G. Humphrey.
8	Sphinx Convolvuli, and 8 others	9	.....	4	1	0 Donovan.
46	Papilio Priamus.....	1	.....	4	14	6 General Davies.
64	——— Claviger, and 5 others	6	.....	7	10	0 MacLeay.
69	A variety of curious Spiders, chiefly from Georgia	110	.....	4	4	0 Donovan.
90	Papilio Iris, Edusa, Hyale, and various.....		.....	4	10	0 Humphrey.
94	Sixteen curious Curculiones	16	.....	11	11	0 Ditto.
95	Scarabæus Goliathus, var.	1	.....	12	1	6 Ditto.
100	Cerambyx Gigas, and 2 others	3	.....	4	8	0 Haworth.
104	Thirteen Species of the Buprestis Genus	13	.....	8	0	0 MacLeay.
105	Elater Flabellicornis, virens, and 8 others	10	.....	4	6	0 Latham.

Lot 112	Cetonia hamata. nitens, grandis, Scarabæus festivus, and 12 others	16	..... £17	0	0	MacLeay.
123	A variety of small Insects of the Mordella, Forficula, and other Genera, among which are Diopsis ichneumonea (and also a species of Paussus)	31	 7	0	0	Ditto.
201	Mutilla bimaculata, thoracica, Scolia signata, and 24 others	27	 3	5	0	Kirby.
269	Sphex tropica, frontalis, Africana, &c.	128	 6	6	0	Ditto.

The total amount obtained for the Insects was £614. 8*s.* 6*d.*; and about £300. more for the Cabinets, Books, &c. with the Copper-plates of the Illustrations.

Of the estimation in which the works and collections of Drury were held by Linnæus, Fabricius, &c. the constant references (especially by the latter) made to them, will sufficiently prove. The former dedicated a fine species of Cimex to Drury, figured in the first volume of these Illustrations, pl. 42. f. 1. 5.; whilst the latter described an American species of Stenocorus from Drury's collection, under the name of St. Drurii (Ent. Syst. 1. 2. p. 302.) and also a Danish Tinea under the name of T. Drurella. The Rev. W. Kirby also in his Monograph upon the English Bees, has named a rare species belonging to the modern genus Eucera, Apis Drurella, with the remark—"In honorem D. Drury, operis entomologici splendidissimi auctoris, cujus museum insectorum rarissimorum undique conquisitorum gazophylacium ditissimum, hanc apem ab illo acceptam nominavi." (Mon. Ap. Angl. 2. p. 286.)

That Drury was in correspondence with these "Heroes Scientiæ" will therefore be unquestioned; and the following letter from the younger Linnæus, communicated to me by the relatives of the former is interesting not only on this account, but for the curious statement relative to the Œstrus humanus then recently discovered in South America.

Celeberrimo Viro

D. Drury. S. pl. d.

Carolus a Linne.

Dum post mortem dilectissimi parentis occupatus fui in redigendo naturalia ab illo in Syst. Nat. nondum determinata, et ut his nomenclaturam pro scientia naturali maxime necessariam continuarem, maxime sollicitus fui illa, quantum mihi possibile foret, synonymis ex præstantioribus auctoribus scientiæ illustrare, imprimis illorum qui pulcherrimis individuorum figuris sint ornati. Tu, Vir Celeberrime, es ex illis, qui in Insectis pulcherrima præstitisti; ex Tuo opere volumina habeo duo, quæ in hereditario cum reliqua Bibliotheca* Parentis habeo; sed an tertius termes s. plures post secundum prodiere est quod ignoro, et de qua re rogarem tuam informationem? et si prodiere ubi inveniuntur? et quo prætio? Amicitiam quam erga Parentem habuisti, spero hanc filiolo permittere licentiam. Optandum esset a Te in his majorem videre augmentum, requirunt insecta figuras; nam vix differentiis determinanda sunt. Insecta australioris plaga mundi a Banksio et Forsteriis indagata, pulcherrime et utilissime pro scientia methodo Tua illustrari possent. Utinam facere vellis, immortalitatem Tuam conservaret scientia hæc!

* Subsequently purchased by the Linnæan Society.

Ego qui nunc novam paro editionem Zoologicam Syst. Nat.* summam in insectis sentio difficultatem ita exprimere, ut aliis intelligas quod tam facile figuris lævatur. Multa præstitit noster De Geer de Insectis, sed majora adhuc præstitisset, si figuræ vivis coloribus ornatæ fuissent. Quis Entomologus est alius apud vos qui collectionem Insectorum possidet ex India occidentali, si quis esset qui desideraret insecta Suecica lubenter Illi ea præstare vellem.

Nuper litteras habui ex America Meridionali ubi morbus endemius est hominum etiam Europeos aggredit illuc venientes quæ causatur a larva Œstri, quæ intra cutem per integrum annum cœlatus et nullo remedio expelli potest nisi periculo vitæ; est nova species Œstri.

Sed hic vale et mihi fave.

Dabam Upsaliæ, d. 10 Mart. 1780.

To Mr. D. Drury, Goldsmith in the Strand, in London.

My late friend A. H. Haworth, Esq. thus spoke of Drury and his works in the year 1807. "In the year 1770 we arrive at the time of publication of a beautiful work on Entomology, that of my late and regretted friend D. Drury, F.L.S. in one vol. 4to. printed at London, and containing comprehensive descriptions in English and French, with an Index of Linnæan names at the end, and a great many coloured copper-plates of such interesting exotic Insects, as had not been before or insufficiently figured. The icons were executed by Moses Harris, in his best style; and are far superior to any of their predecessors in Britain.

"It is also unquestionably the first work in this country in which the trivial names of Linnæus are suffered to make their appearance, and although only given in the shape of an index, their extensive value throws a lustre on the utility of the work, which, unaided by them, would not have reached a second volume, published in 1773, and a third in 1782; and even a fourth would have appeared if the author had lived much longer;† as he himself assured me, some time prior to his decease; wherein would have been delineated some of the gigantic and extraordinary insects of Demerara, in which remote territory he had successfully employed a collecting agent. Mr. Drury's Cabinet was one of the most extensive ever made; and is said to have contained, in species and varieties, the surprising number of 11,000 insects. He spared neither pains nor cost in getting them together, and like Petiver of old, sent printed instructions, in various languages, all over the world for that purpose, by captains of ships and others.

"Soon after his decease, at an advanced age, which happened about two years since, his valuable collection was disposed of in London, by public auction."—(Trans. Ent. Soc. Vol. I. 1807. p. 34.)

The decease of Mr. Dru Drury occurred on the 15th of January, 1804, at the age of eighty, and he was buried at the parish church of St. Martins in the Fields.

J. O. W.

* This contemplated edition of the Syst. Nat. never appears to have been published.

† I find no notice of this contemplated fourth volume amongst Drury's manuscripts.

MR. DRURY'S PREFACE

TO THE FIRST EDITION.

VOL. I.

It is universally allowed that the study of nature is one of the most pleasing employments that can engage the mind of man. The entertainment it affords is as infinite as the variety of subjects of which it is composed; and such a vast field of speculation lies open to our view, either in the animal, vegetable, or mineral worlds, that each of them is fully sufficient to engross the attention of a single person. It must be allowed, that the study of natural history is so far from having attained that degree of perfection it might have done, by the assiduity of the curious, that it cannot, at present, be considered as having attained its meridian; and the slow manner in which it arrived even to that, has subjected us very much to the reflections of foreigners; many of whom appear surprised, that a nation, not inferior to others in every branch of science and knowledge, should discover so great a want of curiosity, and little attention to a study that has been productive of so many advantages to mankind, and probably, may hereafter produce many more. Certainly, such opportunities for improvement never presented themselves in this kingdom, as in the present age. All corners of the world are visited by our ships; the remotest shores of Europe, Asia, Africa, and America, are not unknown to our countrymen; but feel the effects of that insatiable thirst for traffic and gain, that animates the present generation. Every lover, therefore, of this study must naturally hope, that such noble occasions of increasing the knowledge of nature, may not be neglected. It is indeed true, that the number of its votaries, in England, are but few, in proportion to other states, where professorships and societies are established under the patronage and protection of the chief personages: yet if we consider it as affording an inconceivable fund of entertainment to its followers, it is rather to be wondered it is not more encouraged and propagated among us, than that we should find a few who have resolution enough to judge for themselves, and follow a study that is always new and always pleasing. The sneers and contempt thrown on it by men of narrow minds, who are impatient at hearing of persons bestowing their time in collecting a plant, an insect, or a stone, may perhaps contribute

not a little to prevent its progress; but whatever character may be stamped, either upon the study, or its professors, by such persons; it is certain, none but men fit to be placed in the first rank, have usually philosophy enough to prompt them to make enquiries into the works of nature. To some the task appears too arduous, to others too intricate, and to the generality too trifling; who are apt to look with contempt on every pursuit that does not coincide with their own opinions; nor must we, from vulgar minds, expect any conclusions in its favour: with these, a horse, a dog, or a cock, seem to bound the utmost limits of their gratifications. But men of refined tastes will judge otherways. They know that the inexhaustible store of entertainment nature affords in the contemplation of her works, is unbounded. It is not to be enjoyed all at once; the more we pursue, the more we shall possess, in proportion as we manifest a greater or less ardour. Nor is the serene placid enjoyment found therein, to be measured by the common gratifications of *sense;* as these often leave stings behind that worry the soul, and subvert the end they intended to promote; while the other offers to us its friendly aid, replete with happiness, health, and peace. And further, if the contemplation of the works of the Sovereign Architect, tends to promote that serious and attentive state of mind which disposes men to the pursuit of virtue, in order to be happy; and if the knowledge and practice of virtue are the means of supporting the mind through all the difficult passages and rugged paths of life; the naturalist bids as fair to be happy as any of the human race. His pleasures are not chequered by remorse, or damped by despair; his pursuits leave no horrors on the mind, or clash with the duty he owes his Maker, his neighbour, or his prince; his conscience suffers not for the indulgence of his mind, nor has repentance need to stalk behind him with an uplifted arm, for injustice committed on his fellow-creatures; on the contrary, it is for them ultimately his labours are pursued, for them he inquires into the various arcana of nature; every part of the earth is searched for their benefit, and its bowels are torn out and examined for their advantage.

On the other hand, if we consider natural history as connected with religion, we shall find them so interwoven and blended together as not to be separated. In this view we shall find it the best adapted for opening the mind, enlarging its conceptions, and giving us the most exalted ideas of the Deity, of any science whatever, astronomy not excepted, whose study, however noble it may be thought, tends not more to the same improvement; for certainly the power, wisdom, and goodness of the Almighty are as conspicuous in the smallest objects, as those of the first magnitude, if *great* and *little* be only relative terms. If, therefore, natural history is able to accomplish this, nothing surely can afford a more effectual cure for infidelity. For whoever heard of a naturalist being an atheist? or of an infidel, who had spent his life in studying and observing the works of nature? I believe none will hesitate to pronounce the man, who has made any considerable progress in this study, and who could entertain thoughts so injurious to the honour of his Maker, to be a more wonderful being than any that ever went before him.

The train of reflections that arise from these considerations, is greater than is consistent with the plan I have prescribed to myself in these pages. If the reader is desirous of being further informed of the uses and advantages of natural history, I shall refer him to Stillingfleet's Tracts, taken from the Amœnitates Academicæ, published at Upsal; where he may be acquainted with many curious and interesting particulars, which I have not room to insert here; my speculations having been confined to one single branch (insects) I shall only mention such observations relative thereto as may be proper for an introduction of this kind.

Insects may, with great truth, be considered as a rank of beings so wonderful and extraordinary, as to strike with astonishment every observer, if we regard either their structure, powers, or use; and creatures, who, at the same time that they challenge our regard, loudly proclaim the wisdom, goodness, and omnipotence of their great Creator. If their shape and beauty are capable of attracting our notice, their ways of living are no less adapted for exciting our admiration; and the more we enquire into their nature and history, the more occasion we shall find for confessing this great truth, "nothing is created in vain." The wondrous manner in which numbers of them pass their lives, during their first states, is unknown to the greater part of mankind. Most people, indeed, know that a Caterpillar produces a Butterfly; but thousands of persons do not know that a Caterpillar is a Butterfly in disguise, as Dr. Lister ingeniously observes,* and as Swammerdam† proved to the great Duke of Tuscany, by stripping off the external skins, and displaying the butterfly concealed beneath them. Many persons are ignorant that plants (even of the most poisonous nature) are the beloved and favourite food of some species of insects, and that what is wholesome and nourishing to one, is pernicious and destructive to another. Who would believe that the hard substance of the soundest Oak was capable of being macerated by an insect, and received into its stomach as food? that it should there yield a proper nutriment for its growth, and that nothing but a substance as hard and firm as that could possibly contribute to the creature's health and increase? Who would imagine that a colony of Ants, an insect so contemptible in size, considered singly, were capable of making animals, of considerable bulk and strength, retreat from them as from a formidable enemy?‡ Who would suspect that numbers of insects are appointed to live, during the greatest part of their lives, within the bodies of other animals, many of whom receive no material injury thereby; some become frantic and

* See Goedartius, translated by Dr. Lister.

† See Swammerdam's Book of Nature, translated by Dr. Hill.

‡ There is a species of ants in Africa, exceedingly numerous, and continually ranging from place to place; not dwelling in colonies or hills, as we see them in England; being armed with strong jaws or forceps, and whatever animal they assail in the course of their travels, they generally by means of their numbers overcome; there being no method of securing themselves, or preserving their lives, but by running into the water. The blacks, as I have been informed by gentlemen who have lived there, will get out of their way, or quit their habitations, taking their children, &c. with them, and wait till the ants have passed them. So numerous is this host, that a deer, hog, &c. being killed and left on the ground, in one night will have the flesh entirely cleared from the bones, and made a complete skeleton.

diseased, and others are doomed to perish, and by their deaths give birth to these their inbred enemies? Who, that is a stranger to natural history, would believe that there are insects destined to live in the waters many months, where their principal employment is the destruction of animals less than themselves, on whom they feed and thrive, till they become inhabitants of the air, when their lives are terminated in a few weeks, perishing by the depredations of old age, if they are lucky enough to escape the power of other animals stronger than themselves? Yet such are the truths existing in nature; truths known to every one conversant with this study. In short, there is no part of the kingdom of nature, where so many wonders are unfolded to us, as in this of insects.

Nor are they to be considered in that contemptible light in which the generality of mankind are apt to place them. We are too prone to think every thing noxious and unnecessary, if we are not fully acquainted with its use. "The poor Beetle that we tread on," serves to fill up an order of beings, as useful and proper in the economy of nature, as that of a partridge or a hare, whose preservation and increase we are so solicitous for. Many others, whose very sight create the most disagreeable sensations, are not less useful and proper, under the same predicament. The carcases of dead animals, which, when putrid, send forth a most nauseous stench, would remain so for a great length of time, were it not for the various kinds of Flesh Flies, who, by depositing their eggs there, help to consume it very quickly, and prevent a continuance so offensive to our nostrils and health. Many kinds of insects are to be found here in England, in great plenty, who, it is highly probable, by a close enquiry into their natures might be rendered very serviceable to us, either mediately or immediately. The blue Dung Beetle (Scarabæus stercorarius of Linnæus) found in great plenty in July, under horse-dung and cow-dung, it is not unlikely may yield effects, either in medicine or dyeing, that at present we are ignorant of. It is certain, it abounds with salts that are strong and pungent; but the examination of them must be left to time, and the enquiry of some ingenious person.

The Meloe Proscarebeus of Linnæus, or English Oil Beetle, described by Moffat, lib. i. cap. 23., also by Godartius in Lister's translation, number 120. yields an oil by expression in considerable quantity, which is used in Sweden, with the greatest success, in the cure of the rheumatism, by bathing the afflicted part. Of this I have been well assured by an ingenious physician who resided there? Might not the same effects be expected from it here as there. Its virtues, I imagine, are not confined to a single country; nor can I suppose the different situations of them will prevent its being equally efficacious here as in Sweden. However, it is certainly worth while to make the experiment.*

* If any person is inclinable to make this trial, I must advise him to collect them in the spring, when they abound with this liquor, and to choose only the females, whose bodies at that season are so large, being as it were overcharged with oil and a great number of eggs, that they seem with difficulty to drag them along. When they have discharged their eggs, the appear much less, and are not furnished with that oil they before abounded with. The males have little, if any of it, therefore are not proper

The Cantharides or Spanish Flies, is a species of insect every one has heard of. They are brought us from abroad, and used medicinally; but principally to raise blisters. For these we pay great sums of money to foreign countries: but a proper examination into the nature of insects might save us the necessity of doing so; for let me not be disbelieved, when I say this very species of the cantharides is found in England.* Might, not, therefore, a close inquiry into the subject, spare us the trouble and expense of applying to foreigners for this article? But are the medicinal virtues of the cantharides confined entirely to that species? Is there none other found in England, answering the same purpose, which we might have by seeking for? If I am not mis-informed, there is. The Musk Beetle, or Cerambix Moschata of Linnæus, is found on the bodies of willow-trees in the month of July, or sooner, if the weather is favourable. This insect, I have been confidently informed by an eminent surgeon (the late Mr. Guy) who tried it, has the same virtues, and produces the same effects as the cantharides; being capable, when properly prepared, of procuring a strong blister in as short a space of time as the other. Whether there is not other insects to be found in this kingdom, whose properties, when examined, might be found similar to the cantharides, is a matter that time only will clear up.

I cannot here pass unmentioned the effects of ants, whose volatile effluvia, arising from their colonies or nests is so great, that a hand rubbed thereon, and applied immediately to the nose of a fainting person, exhilarates and refreshes equal to the spirit of hartshorn, or what is called sal volatile.

Such are the known medicinal uses of insects; and under the article of clothing they serve us in a more conspicuous manner. To many thousands of persons they afford the means of living with comfort and happiness. Even kings are indebted to them for their grandest garments. Immense fortunes have been procured, by their means, to persons in trade, and the great number of people who daily subsist by manufacturing silk, either by spinning, weaving, or dyeing it, have the greatest reason to thank Providence for the institution of this insect. To the last, the Cochineal (Coccinella Cacti of Linnæus) affords him the power of giving our silks and cloths the most beautiful and lasting colours; being without it unable to produce such proofs of his ingenuity; not to mention many other occasions wherein this insect is peculiarly serviceable. Nor is there any part of the world where they do not directly, or secondarily, serve mankind for food. In every kingdom of the earth, where they are to be found, shrimps, prawns and crabs are eaten by all ranks and degrees of people, if animal food is allowed them; and our cray-fish or lobsters must not

for the purpose. This insect is of a blue colour, and found in the fields during the months of April and May, in the state I have mentioned; the blue colour is not shining and beautiful as that on the belly and legs of the blue dung beetle, but of a fine mazarine blue, without that polish. It is about an inch and half long (the males are shorter), the head and thorax about five-eighths of an inch, being very small and slender for the size of the insect.

* I have seen in the cabinet of a very curious lady, sister to Ralph Willett, Esq. of Dean Street, Soho, not less than forty of this species, being taken near his seat at Morley Place, near Winbourn, in Dorsetshire, where she informed me they were found in great plenty during the month of June or July, frequenting the privet trees. I have also found them in the environs of London, but not plentifully.

be excluded from the same order. The Locust represented in Plate 50. Fig. 2. is eaten by many tribes, and, I may say, nations of people, in Asia and Africa. These animals are frequently driven from their native soils, by strong winds, into foreign countries, where, for several days together, by their inconceivable numbers, they obscure the light of the sun, and make the inhabitants tremble for their vegetables. It is at those times the Asiatics and Africans gather them, and eat them with much delight, dressing them, either by stewing, or frying them with oil; they also pickle and sell them publicly in some of the markets of the Levant, and many other parts.

The caterpillar belonging to Fig. 1. of Plate 38. which I have mentioned in my description of that insect to be eaten in the West Indies, and considered as a dainty, is sought for by those persons who are admirers of that food, in the most diligent manner; and I have been informed, by gentlemen of undoubted veracity, that so exceedingly delighted are they with it, as to employ negroes on no other business but to go into the woods on purpose to procure these caterpillars, by digging them out of the bodies of certain trees, the only places where they are to be found. Perhaps the cossi of the Romans, a kind of food we are told they were much delighted with, might be a species not much unlike this; however that be, these are considered as amply recompensing, by their delicious flavour, the pains taken to procure them.

Honey is a substance known to every one, and the agreeable liquor made from it, which in some countries serves the inhabitants for their constant drink, is not to be procured but by the industry of the agile bee.

In fine, the limits of this preface will not permit me to dwell minutely, and point out the benefits mankind does, and may receive, by the institution of this order of animals. I shall again refer my reader to the book I mentioned before, "Stillingfleet's Tracts;" where he will find these and many other advantages I have not mentioned, treated of in a most ingenious manner; being the observations of some of the greatest men of the university of Upsal in Sweden; for this reason, therefore, I shall consider this subject no farther, but proceed to describe the plan of the work; wherein, if the reader expects to find the insects classed in systematic order, as well as represented, he will be greatly disappointed. It is not my present design to enter into the scientific part of the study, by arranging the insects according to any system now established; nor will the reader find that I have given a single name to any one here figured. This, indeed, must be the consequence of not following the system of any author, unless I had formed one of my own; for it is impossible I should give names to them, particularly trivial ones, without doing one or the other. The calling an insect by the general appellation of moth, butterfly, &c. I cannot consider as derogatory to what I have said. Hence I flatter myself I shall avoid all occasion for reflection by the disciples of different authors, in not following the method established by others; and, therefore, my desire of giving no room for exceptions of this kind, has induced me to follow no one whatever. By this, also, I have left it in the power of every person to

class them according to his own fancy; and, as every one has thus an opportunity of following his favourite author, none, I hope, will object to a method, that will put it in his power of indulging his own inclination.

I must here inform my readers, that this work can by no means be considered as a complete one. The most transitory view will confirm this. Nor can I take any merit to myself by its publication, unless the great care that has been taken to give just and accurate figures of the subjects, in which the different generical characters, according to the several authors I am acquainted with, are truly represented, will entitle me to any.

Indeed, the many opportunities I have had of observing the great tendency all kinds of insects have to perish and decay, particularly moths and butterflies, first gave me the hint of preserving them from oblivion, by thus delineating them on paper. For these last are of such tender and delicate natures, that however pleasing and agreeable they may be to our sight, they are not easily to be preserved with all their gay and striking plumage. Our utmost care can only secure them to us a few years; and if they are exposed to air or sunshine, we are quickly robbed of them; the latter being capable, in a few months, of entirely destroying their colours, and the first in as short a space, will totally consume every part of them, leaving nothing behind but a little dust.

Hence it is, I have been induced to give figures of foreign insects. In prosecuting which, the reader will find many that have never been described by any author; and if the rescuing them by this method from the ravages of time, if the delight and amusement arising from contemplating subjects of this kind, or if an attempt to promote and encourage this branch of natural history meets with the encouragement I hope for, I must assure the public, no labour on my side shall be wanting to render it complete, by adding future volumes, as the subjects I should receive from abroad, and my own leisure, will enable me to do; and this, I flatter myself, I shall be able to accomplish by the means of a few ingenious gentlemen situated in different parts of the world, whose correspondence I am honoured with, and by whose assistance I shall be able to give sometimes a tolerable history of an insect, or as much of it as has fallen within their observation; by which means, new subjects of speculation, some unnoticed circumstances in insect life, may arise, that cannot fail of being an acceptable embellishment. But I must observe, such pieces of information cannot be expected to be numerous; for the difficulty of procuring the natural history of foreign insects is so exceedingly great, that it is better conceived than described. Few persons, who visit foreign countries, have curiosity sufficient to prompt them to make such observations, or indeed any enquiry, into the works of nature. The desire of acquiring wealth, by the means of trade, is the grand motive that induces them to leave their native country; observations in natural history being generally quite foreign to their thoughts; the desire of extending their commerce, and making their fortunes, taking entire possession of their minds, and swallowing up every other consideration. Thus, we see, it is not from such persons we must expect any improvements tending to promote this study; it is

only from men of a liberal and ingenious turn of mind, settled there, that we can hope to have any information of the state of nature in distant regions; and the scarcity of such men I have found to be exceeding great. For these reasons the reader must not expect to find the caterpillar and chrysalis of every insect represented. It is sufficient if I am able to give figures of many exotics that have hitherto been unknown. The natural history, the forms of the caterpillars, ways of life, haunts, &c. can, in such cases, be known only to persons living on the spot, and who have speculation enough to observe them. Whenever I receive such pieces of information, they shall, certainly, not be withheld from the public.

When I first engaged in the business of describing the different insects that compose the following work, I found myself surrounded with difficulties of so unexpected a nature, that I had more than once entertained thoughts of postponing, if not totally relinquishing so arduous a task. Nothing but the strong desire I had of promoting the study of natural history, could have led me to overcome a sense of my own incapacity of writing with that precision, which the public eye demands; and, therefore, I have reason to hope for the candid allowance of the ingenious, to faults, which might, perhaps, escape from the pen of a *master*, on a subject so new as the present. Among the rest, I laboured under no little trouble from a want of knowing what names to give to many colours found on the wings of some of the farinaceous tribe. The want of a *series*, or standard for names to colours, is a matter much to be lamented in this kingdom. I know no English author that has attempted it; perhaps the arduousness of the task may be the reason it has not been done; for if we form to ourselves an idea of the difficulty of bringing forth that innumerable train of colours that is to be done from only a yellow, a red and a blue, we may partly judge of the labour that man has to undergo who shall attempt it. In my case, the great variety of tints to be found on the insects, the harshness of some, the softness of others, together with the manner of their running into one another, increases the difficulty, and renders descriptions a matter of such labour, that nothing but the strongest resolution and perseverance could overcome. From hence, I hope, if the reader should chance to meet with any part among them, that does not entirely correspond with the colour given to the print, he will impute it to its proper cause, the painter. I know of no defects of this kind; but it is not impossible some may have escaped my observation, among such a multitude of figures which I had to correct. It is necessary I should inform the reader, that all my descriptions have been taken from the *natural subjects* themselves, and not from the *coloured prints* of them; and that my intention therein, is not to give a perfect idea of the insects, without the help of the figures, but only to assist the imagination in knowing what is described. And when we consider the advantages that good engravings have over verbal descriptions, the former representing to the mind, at first view, the object designed to be understood, without putting us to the trouble of calling all our ideas, all our powers of conception to our assistance, in order to discover what is intended to be described;

while the latter, though given by the best writers, often puzzles and confounds the mind, if our ideas do not keep pace with the author's meaning, the present work, by having every coloured figure explained, must render it superior to any hitherto published in this kingdom. The last author that published any figures of exotic subjects in natural history, was Mr. Petiver, who, in his Gazophylacium, delineated a great variety of all the different *orders*; many of them exceeding curious and uncommon, being collected from various parts of the world. But they were sent forth uncoloured, and almost undescribed; circumstances that render them less estimable by the difficulty there is, in many instances, of knowing what the author meant; the shape of the animal, plant, &c. being the principal, and, sometimes, the only thing, we can understand. But although many of the figures consist of mere outlines, not exquisitely well engraved, it is not without merit. There are a great many very uncommon subjects exhibited, that were not known to exist in nature, till he held them forth to public view. It is, in short, a work, that, at the same time it manifested his desire for promoting his favourite study, was a proof of his assiduity, affording great room for speculation; and as the present is an improvement on his plan, I flatter myself it will not be unacceptable to the lovers of natural history. There is yet another advantage arising from the descriptions, that is not less than what I have already mentioned. If this work should fall into the hands of a bookseller, after my decease, the public would not probably be pestered with copies so execrably coloured, as is generally the case with books of this sort, after the author's death; the descriptions will be such a guide for colouring the prints, that capital errors will not be able to find admittance: the grossness of colouring a part yellow that should be red, or green, that ought to be blue, would immediately be detected; and the publisher, for his own sake, would undoubtedly be careful to have the prints justly and accurately done.

The experienced naturalist will perceive, that, throughout the quotations, I have not availed myself of any of the ancient authors. I have scarcely mentioned Mouffet, Aldrovandus, and others. It is certain, the figures to be seen in the works of most of the ancients are so bad, I dared not give any quotation from them. The incorrectness of the outlines, the irregularity and impropriety of the spots and marks, together with the looseness of the engravings, renders them too imperfect for any one to venture mentioning them. Indeed they are, in general, so little expressive of the insect intended to be represented, that no dependance can be had on their figures, especially the farinaceous winged tribe. Clerck, Merian, Roesel, Petiver, &c. are the authors I have principally mentioned, among the iconographers; and if the insect has been figured by a great many authors, as particularly Plate 34. Fig. 7, 8. I have only mentioned a few: the rest may be known by looking into the Systema of Linnæus*, under the title mentioned in the quotation. This author is the principal one I have quoted among the descriptive writers: his great judgment in this study, the plain method he has laid down for the classing of insects, together with the

* The synonyms of this author are all taken from the 12th edition.

excellency of his generical characters, are what must endear him to every professor of this study. I speak only of that part relating to the insect kingdom; the merits of the other parts are best known to those conversant in the respective branches. I must not here pass over a circumstance, which it is proper to apprize my readers of, by way of apology for giving a few figures (but a few) that have been published already in this kingdom. When I first laid down the plan of this work, I had no intention of confining myself to those subjects that were non-descripts; but proposed to give figures of any exotic insects that might fall into my possession, or what I could procure drawings of, by the assistance of those gentlemen who were friends to an attempt of this sort. I was willing to promote this branch of natural history, by any method that lay within the compass of my little sphere. This I was the rather prompted to, by the consideration of its being an attempt entirely novel in this nation, and conducted in a way different from any yet pursued. But a little recollection convinced me I was wrong. I was soon sensible, that the giving figures, already known and published here, could do no service to the study, or benefit the reader; it is possible I might give a better figure than that before published; the engraving might be softer, more delicate, and better becoming the subject; or the colouring more exact and just: but this would not be improving the reader's judgment, or increasing his knowledge. In short, from that moment I altered my plan; and it is to this mistake a few figures are inserted in different places, which have before made their appearance in England, either separately, or mixed with other subjects of natural history. From that time I took care to delineate none that I was conscious had engaged the pencil of any preceding author; but confined myself to such, whose novelty and striking appearances could not fail to recommend them. To such non-descripts I have paid the greatest deference; for in some of the plates, among the butterflies and moths, I have given complete figures of both the upper and under sides; a practice that, as deviating from my general rule, I should not have done, if the richness and softness of the colouring had not been so extremely pleasing, as to render it scarcely possible to dispense with it. It is only to a few I have paid this particular respect. In general, I have given to the butterflies, only figures of one half their under sides, but whole upper ones; and of those moths that have no representations of their under sides, the reader may conclude there is no material difference between their upper and under ones, or else the latter is too poor and mean to justify the giving a figure of it. I must just mention, that although I used this forbearance to those figures that had been heretofore published, I by no means meant to debar myself from representing such as had been only *verbally* described; as is the case with a great many to be met with in the Systema of Linnæus, and in other authors. The refraining, therefore, from such subjects, would have been rather condemnable than fit to be approved, for the reasons I mentioned before, of the great difficulty there is in understanding, sometimes, the best verbal descriptions that ever were given; therefore figures of this kind may not improperly be considered as explanatory, or as illustrations to

such verbal descriptions, affording the student a two-fold pleasure, by comparing them together.

If the reader has made no progress in the study of natural history, he will probably find it difficult to understand the several *names*, or *terms*, the different parts of insects are called by; and which occur in every description. For this reason I think it incumbent on me to give the most plain and familiar explanation of them I possibly can. This I have done two ways; by methodical definitions, and figures; and in both of them shall make no scruple to follow the method laid down by that great master of natural history, the judicious Linnæus, whose excellent plan, for the knowledge and classing of insects, demands the utmost thanks and regard from every lover of this branch of science. From his plan I have taken the hint of giving some figures of different genera, with the proper names of the respective parts in a plate by themselves. By these the reader will not only be greatly assisted in understanding the descriptions; but it will enable him to class them with more facility, if he is inclined to do so. I therefore go on to explain, first the *terms* used throughout the whole; and afterwards the distinct and different *parts* of insects. In doing this, I divide them into

Order, Class, Genus, and Species.

Order, is a general term, applicable to a whole race of animals, whereby they are distinguished from each other, as beasts, birds, fishes, &c.*

Class, a term by which insects, as well as other animals, are divided into their respective genera or tribes, as the farinaceous, crustaceous, transparent, &c.†

Genus, a term dividing each class, as butterfly, moth, hawk-moth, constitute the farinaceous (Lepidoptera); dung-beetle, lady-bird, goat-chaffer, and many others, make up the crustaceous (Coleoptera); cock-roach, locust, bug, and some others, form the semi-crustaceous (Hemiptera, Linn.), &c.‡

Species, a term comprehending a distinct or individual sort in each genus, as the pearl-bordered, admirable, skipper, &c. among the butterflies; egger, drinker, peppered, &c. among moths, &c.

To these I must add the word

Variety, a term by which two insects of the same species are known, though differing a little (not characteristically) in colour, size, &c.§

* The primary division of the Annulose subkingdom, now adopted, is into classes, Crustacea, Arachnida, Insecta.

† The primary division of the class Insecta, now adopted, is into orders, Lepidoptera (called farinaceous by Drury), Coleoptera (called crustaceous by Drury), &c.

‡ In consequence of the great increase of the science it has been found necessary to divide the Orders of Insects into Sections, Families, Subfamilies, &c. before arriving at Genera, which are now much more limited than in the time of Linnæus.

§ There is no branch of natural history where the existence of a *Lusus Naturæ* is so plain and observable as in this, particularly among the insects brought from warm climates; where the wantonness and luxuriance of nature is so great; that its laws, strict and regular as they are, through the rest of the animal creation, almost seem to be invaded and broke in upon. Instances, also, are frequent in this study, of a cluster of eggs being discharged by a female, the insects springing from which, have differed in the circumstances above-mentioned so very greatly, as in some cases to be mistaken for different species.

I shall next proceed to explain and describe the different parts composing insects, by dividing them into the Head, Thorax, Abdomen, and Limbs.*

The HEAD (Fig. 1, 2, 3, *a.*) includes the ANTENNÆ,* MOUTH, PALPI, EYES, TONGUE, JAWS, and HORNS.

The *Antennæ* are formed of various shapes, according to the different genera, as may be observed in the figures, and seem instituted by nature not only for guiding the animal in its passage, but likewise for other purposes; being endued with an exquisite sense of feeling and perception. Fig. 1. *d d.* Fig. 2. *c.* Fig. 3. *c c.*

The *Mouth* is placed in the head, but sometimes close to the breast, as in the spider tribe; sometimes terminating in a horny beak, as in Plate 32. Fig. 1. also in Plate 42. Fig. 3 and 7. In some it is furnished with strong mandibles like pincers, as in Plate 32. Fig. 6. and Plate 37. Fig. 1, 2, 3, 4, 5, 6. In others it is so covered and guarded by the palpi, particularly among the moths, that it is not to be seen.

The *Palpi* are parts placed close to the mouth, and variously shaped; as may be seen by comparing those of the Lepidopterous with those of the Coleopterous, and other tribes; consisting of a greater or less number according to the species or genus; in some being only two, in most of them four, and in some six, (Cicindela, Carabus, Linn.) The use and purpose of these parts we are ignorant of. Fig. 1. *c c.* Fig. 2. *b.* Fig. 3. *b b.*

The *Eyes* are generally immoveable, and suited differently; in some to see only in the night, in others in the day; and differ in number according to the genera and species, having in general two only, but in some five,† in others eight, as the spiders. Fig. 1. *b b.* Fig. 3. *d d.*

The *Tongue* (elongated maxillæ) is sometimes curled up spirally like the spring of a watch, as in butterflies and some moths, &c. in others it (including the labium) is doubled under the head, as in bees and wasps; but a great many species are destitute of this elongated part.

The THORAX is principally composed of the BACK, BREAST, and in some the SCUTELLUM, in others the MESOSTERNUM and DILATED POSTERIOR COXÆ.

The *Back*, dorsum or upper part, answering to the back in some animals, terminates in some species in a triangular manner, so as to represent the scutellum, as in Plate 33. Fig. 5, 6, and 8. Tab. Ann. Fig. 1. *f.* Fig. 2. *e.*

The *Breast*, or sternum, is the under part of the thorax, and always furnished with legs.

The *Scutellum* is a small but hard part like a scale, frequently of a triangular shape, placed behind the dorsum of the prothorax, and joining to it. It is not developed in every genus, being chiefly perceived in the Coleopterous, Hemipterous, and transparent-winged orders.

The *Mesosternum* is united to the fore part of the breast, extending beyond the middle legs towards the fore ones; and observable only in some species of the Coleopterous order. By Linnæus and several other authors it is called sternum.

* In these definitions, I have thought it serviceable to give the modern names without introducing those, now out of use, employed by Drury, &c. The most conspicuous parts are alone noticed. *(J. O. W.)*

† By five eyes, I mean those that have three lesser ones, as in Plate 43, 44, 45, &c. See the Plate in the Preface, fig. 4.

The *Posterior Coxæ* are only conspicuously enlarged in some particular species (dung beetles). There are two of them placed on the sides of the breast next to the abdomen, under the hinder thighs. In some they are placed remote and distinct from it, in others they lie close; being moveable in some, in others they are fixed. The use of these parts we are ignorant of.*

The *Abdomen* consists of a number of annuli or rings, and contains the greatest part of the intestines and other viscera; being united to the trunk, and formed with holes on the sides, through which the insect breathes.

The LIMBS comprehend the TAIL, LEGS, and WINGS, with their cases.

The *Tail* is placed at the extremity of the abdomen; and in some is furnished with a sting, in others it is armed with a pair of forceps; sometimes with a single bristle, sometimes with a double one; in some with a pair of claws like a crab, in others like a fork.

The *Legs* include the coxæ, trochanters, femora, tibiæ, and tarsi; the latter consisting of two, sometimes of three, four, or five articulations. In some the fore ones resemble a crab's claws. Some are furnished with spines, others are smooth and plain. The hinder ones are formed for running, leaping, or swimming.

The *Wings*, being always two or four, are either plain or folded, erect or open, lying flat or inclining downwards, &c. In some they are dentated or scolloped; and some are furnished with two projections like tails. They are also membranaceous, reticulated, or transparent, and frequently adorned with beautiful colours. In some they are curiously folded within two crustaceous cases, that are either smooth or rough, striated, furrowed, punctated, &c. in some these cases are soft and flexile, in others hard like horn; the Hemipterous are partly soft and transparent, as in Plate 49. Fig. 2. and partly opake and hard, as in Plate 42. Fig. 1. Plate 43. Fig. 2. and Plate 45. Fig. 5.

It is necessary to observe, that I have not been so prolix and explanatory in the foregoing definitions as I should be, if I intended to arrange the figures under their respective classes, or establish any system for doing so; I have explained no more *terms* or *parts* than what are sufficient to enable the reader (if he is not an adept) easily and clearly to understand the descriptions. It is likewise necessary to mention, that I have given English names to most of the parts, where I could do it with the necessary propriety for serving this particular purpose; and where I could not substitute an English word, that was apposite and significant, I have preserved the Latin one, as used by Linnæus and others. Thus, for instance, the term palpi I would have altered, if I could have found an English word that conveyed the same idea; but not easily finding one, I have kept to the original. I have not forgot the terms mustachios, whiskers, &c. which I might have used in its stead; but as these parts in many insects bore no analogy or resemblance thereto, it being in a great many of them like a short jointed filament or thread, I rather chose to preserve the Latin one. The same practice I have observed with the term antennæ. For though feelers is the general explanation given to this word, I could not prevail with myself to use it. The reason is, because these animals seem to have a power

* They are part of and give support to the hind pair of legs.

An Inch divided into eight Parts

Fig. I

Fig. II.

Fig. III

Dentated Wings

Plain or Even Wings

Fig IV

Angulated wings

ALCOLMSON WEST MONROE

of applying these parts to purposes different from that of feeling. By the antennæ they are capable of distinguishing and perceiving, as well as feeling; and I am strongly inclined to believe, it is by them the males are capable of discovering the females at a great distance. It is certain their powers of perception are very obvious and remarkable, which, by close observations, we may soon discover; and unless we allow them capable of smelling without nostrils, I do not know what parts they exercise, or by what means they so readily discover, not only their females but their respective kinds of food, the places proper for depositing their eggs, &c. The male moths appear to have this faculty of discovering their females in a greater degree than most other insects; for there are but a very few, if any, belonging to this genus, whose females pass the first night after they quit the chrysalis without coupling with the males; owing to unconquerable *desire* in the latter, and the strong effluvia or scent emitted by the former for attracting their mates. Every adept is fully acquainted that a female moth, known by the name of the Egger (Phalæna Quercus of Linnæus), taken into the fields the first day it is hatched, will most certainly (though shut up in a box) allure all the males round the country that are within the sphere of its attraction, and even from a great distance; who will at first fly round the box with wonderful swiftness and eagerness, and afterwards settling thereon will hunt and run about it with the greatest impatience, endeavouring to get at the inclosed female; and all this from the strongest desire of copulation; for the minute that action is performed by a male, the attractive property of the other ceases. The powers of perception and distinction, therefore, are very great; and what parts of the insects, unless it be the antennæ, are employed in this search I am at a loss to discover. However, at present, I presume it will not be necessary to offer any further reasons for using this term, as the name substituted is sufficient for it to be known by, it will fully answer the intended purpose.

The names of the other parts are too intelligible to require any explanation.

The plate annexed (being the last thing I shall speak of) requires but little to be said in its favour. The use and advantage of it is too obvious to dwell on. I have already mentioned, that engravings and delineations claim the preference in the highest degree of verbal descriptions; and as such, I presume, the reader will find this plate of the greatest service in assisting him to understand the descriptive parts with clearness and ease. I must only recommend it to him, if he is desirous of avoiding difficulty and trouble, to make himself fully acquainted with the terms and names of all the parts of insects, before he begins to read the descriptions.

Explanation of Fig. I.

a The head.
b b The eyes.
c c The palpi.
d d The antennæ.
e e The shoulders. The patagia, or tippets, are placed here.
f The thorax. The part underneath and opposite to this is termed the breast.

g The abdomen, with the annuli or rings of which this part is composed; very conspicuous in such of the Lepidoptera as are figured in Plate 27, 28, and 29.
A A The anterior wings.
B B The posterior wings.
h h The bases of the wings.
i i The tips.
k k k k The anterior margin.
l l The posterior or internal margin.
m m m m The external edges.
n n The lower corners of the anterior wings.
o o The upper corners of the posterior wings.
p p The abdominal edges. In the butterfly tribe this part forms the abdominal groove.
q q The anal angle.
r r The tails; whereof some species have four, as in Plate 1, 2, and 7.
s s The eyes on the wings. From round spots resembling an eye.
t A waved bar.
u u An irregular indented bar.

The terms upper side and under side, mentioned in all the descriptions of the farinaceous tribe, require no explanation.

Explanation of Fig. II.

a The head.
b The palpi.
c The antennæ.
d The eyes.
e The dorsum of the prothorax, commonly called the thorax in beetles; whereof the under part is the prosternum.
f The lateral margin of the thorax.
g The posterior margin of the thorax.
h h The upper horn.
i i The lower horn.
k The scutellum.
l l The wing cases, or elytra.
m m The suture.
n n The lateral margin of the wing cases.
o The anus.
p The fore thigh.
q The middle thigh.
r The hinder thigh.
s s The fore tibiæ.
t t The middle tibiæ.
u u The hinder tibiæ.
w w w w w w The tarsi.
x x x x x x The articulation of the tarsi with the tibiæ.
y y y y The articulation of the tibiæ with the femora.
z z z The hooks or claws, (ungues.)

Explanation of Fig. III.

a The head.
b b The palpi.
c c The antennæ.
d d The eyes.
e The prosternum; whereof the upper part is the prothorax.
f The mesosternum.
g g The dilated posterior coxæ.
h h h h The abdomen, with its annuli or rings.
o The anus.
p The fore thighs.
q q The middle thighs.
r r The hinder thighs.
s s The fore tibiæ.
t t The middle tibiæ.
u u The hinder tibiæ.
w w w w w w The tarsi.
x x x x x x The articulation of the tarsi with the tibiæ.
y y y y y y The articulation of the tibiæ with the femora, or thighs.
z z The hooks or claws, (ungues.)

Fig. IV. is inserted only to shew the three little eyes, which are placed in a triangular manner, and mentioned in some of the descriptions, viz. Plate 43. Fig. 4, 5, 6, &c.

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ILLUSTRATIONS

OF

EXOTIC ENTOMOLOGY.

NYMPHALIS (CHARAXES) JASON.

Plate I. fig. 1.

ORDER: Lepidoptera, *Linn.* SECTION: Diurna, *Latr.* FAMILY: Nymphalidæ, *Swainson.*

GENUS. NYMPHALIS, *Latr.* Papilio Eq. Achiv. *Linn. Drury.* Papilio Nymphalis, *Fabr.*
SUBGENUS. Jasia, *Swainson.* Charaxes, *Boisduval.*

NYMPHALIS (CHARAXES) JASON. Alis fuscis, anticis utrinque strigâ maculari limboque apicali fulvis, posticis bicaudatis, ordine postico macularum sublunarium fulvescentium, omnibus subtus ad basin ferrugineis caracteribus fasciâque albis. (Expans. Alar. 3—4. unc.)

SYN. Papilio Jason, *Linn. Syst. Nat.* 2. 749. *No.* 26. *Herbst. tab.* 64. *f.* 3. 4. 5. *Cram. pl.* 339. *f.* A. B. *Drury, vol.* 1. *p.* 2.
Pap. (Nymphalis) Jasius, *Fab. Ent. Syst. t.* 111. *part* 1. *p.* 61. 191. *Drury, vol.* 2. *App.*
Nymphalis Jasius, *Latr. et Godart. Enc. Meth. v.* 9. *p.* 350. 1.
Charaxes Jasius, *Boisduval Hist. Nat. Lepidopt. pl.* 7. *f.* 12. *(imago) pl.* 3. *A. f.* 9. *(larva and pupa.)*

HABITAT: Barbary, Asia Minor, and the Northern Coast of the Mediterranean Sea.

Upper Side. The anterior wings are of a fine chocolate, with an orange-coloured margin running along the exterior edge, within which are some faint round orange spots; those next the anterior edge, where they begin, being strongest. The posterior wings are furnished with four tails (the outer ones being the shortest) and are of a blue black. A yellow scolloped margin runs round their external edges, verged with black; above which are some lunate spots of a sky blue.

Under Side. The anterior wings, next the body, are of a faint dark red, with many spots and marks of a dirty olive, differently shaped, margined with white. An orange margin runs along the exterior edge, intersected by the blue tendons; and above it are several triangular marks of a faint orange, on a blueish hazel ground, which deadens as it approaches the margin. The posterior wings have on each a white band, running transversely, and meeting just below the extremity of the body; within which, and including the anal groove, are many round, oval, and other shaped marks of chocolate and dark olive; verged with white. A scolloped margin, of a deep lemon colour, runs along the posterior edges, verged with dirty green, and separated from the white band by a bar of hazel colour, and some large brown reddish spots and marks. Two blue spots are placed just above the two longest tails, with several lesser ones, just above the lemon-coloured margin.

I have thought it more in accordance with the principles which are now almost universally adopted, in regulating specific nomenclature, to revert to the original Linnæan

name of Jason in preference to that of Fabricius. This butterfly may be regarded as one of the most splendid of the Lepidoptera of Europe, to the southern portion of which and to the northern shores of Africa it appears to be confined. The strength of its general structure indicates great powers of flight, and we accordingly find that it is able to sustain itself in the air with very little motion of the wings. The female differs from the male only by having the centre of the posterior wings adorned with small blue spots on the upper side. There are two broods in the year, namely in June and September, and, according to M. De Villiers, the insect emits a strong scent of musk. The caterpillar is naked and thickened in the middle of the body; the tail tapering into two short points, the head is also armed with two conical erect horns. In this respect, therefore, this insect very nearly approaches the genus Apatura, of which the purple Emperor, Ap. Iris is the type, thus proving the advantages to be obtained, in studying the natural relations of this difficult order of Annulosa, from an accurate acquaintance with the structure and habits of the early stages of the insect.

There are several species, having the same general form as the Jason, including Athamas, pl. 2. fig. 3. 4; Eudoxus, vol. iii. pl. 33. f. 1. 4; Camulus, vol. iii. pl. 30. f. 1. 2. Mr. Swainson has, accordingly, formed them into a distinct group, to which he has given the name of Jasia, in pursuance with his customary, but scarcely correct plan, of raising the specific name of the tpyical species into a generic name, and then giving a new specific name to such type. M. Boisduval, rejecting this system of nomenclature, has more recently proposed for the same group the name of Charaxes, which I have adopted.

Amongst the species very nearly resembling Jason, is one sent from Africa* to Mr. Drury by Mr. Smeathman, which, according to the observations of that traveller, published by Drury, in the introduction to his third volume, flies in the heat of the day with amazing rapidity, and seldom descends within eight feet of the ground. It glances from the prominent branches of one tree to those of another, as swift as a swallow, and turns its head about instantly to the glade, or path, and will not suffer any person to approach within a striking distance of it, but darts away on the least motion of the body. If the collector exert his patience it will at last become more familiar and careless, and is then to be caught upon some particular branch, to which it will appear more attached than to another.

* The name of this African species has not been recorded. The following additional observations by Mr. Smeathman will be serviceable in enabling us to obtain an idea of the treasures which, even yet, European entomologists may expect to receive from this but little investigated quarter of the globe. "The whole country of Africa, within the tropics, is one immense forest, except where the sandy plains are too unsettled to afford a proper footing for vegetation. Wherever any inhabitants settle, they make plantations by cutting down the woods and burning them to fertilize the ground, and never sow two years together on the same spot, but let the trees grow up again for two or three years, by way of fallow, before they attempt to get another crop from it. It is these spots, which Smeathman calls recent plantations, which afford the greatest variety of insects and the easiest obtained. In the second and third year they become impassable to human feet."

THECLA ACIS.

Plate I. fig. 2.

ORDER: Lepidoptera. SECTION: Diurna. FAMILY: Lycænidæ, *Leach.*

GENUS. THECLA, *Fabr.* (Syst. Gloss. Synops. in Illig. Mag.) Polyommatus, *Latr. et Godart.* Cupido p. Schrank Papilio (Pleb. rural.), *Drury.*

THECLA ACIS. Alis suprà fuscis subtùs pallidioribus, posticis bicaudatis maculâ rufâ ad angulum ani, subtùs punctis duobus fasciâque obliquâ albis. (Expans. Alar. 1 unc. 3 lin.)

SYN. Papilio Acis, *Drury, App. v.* 2. (1773). *Cram. pl.* 175. *fig.* C. D.
Papilio Mars, *Fabr. Mant. Ins.* 2. 66. *No.* 624. (1787). *Herbst. Pap. tab.* 288. *f.* 1. 2. *Fabr. Ent. Syst.* 111. 1. 265. 24. (Hesperia M.) *Encycl. Meth.* 9. 635. (Polyommatus M.)
Papilo Ixion, *Fab. Mant. Ins.* 2. 71. *No.* 671?

HABITAT: New York (*Drury*), taken on 31st August. South America (*Fabr.*): Antilles (*Godart*). Cape of Good Hope (?? *Cramer*).

Upper Side. The anterior wings are entirely dark brown, without any spots or marks.—The posterior wings the same, with four tails, the inner ones much longer than the others; close above which latter are two red spots, edged at the bottom with black, and two more, placed at the anal angle. The cilia is white.

Under Side. All the wings are of a dark lead colour. A very narrow black and white line crosses the anterior wings, parallel to the external edges; another indented irregular line crosses the posterior wings, beginning near the middle of the anterior edge, and meeting just below the extremity of the body. Four long reddish spots are very visible on this side, below which are four black ones.

This species is nearly allied to Papilio Echion, Linn. Syst. Nat. p. 788. figured by Roesel, tom. i. tab. 7. f. 3. 4. which is also an American species, but differs, as Drury observes, in wanting the red spots on the upper surface of the lower wings, in having a red line crossing the wings on the under side, &c.

THECLA SIMAETHIS.

Plate I. fig. 3.

ORDER: Lepidoptera. SECTION: Diurna. FAMILY: Lycænidæ, *Leach.*

GENUS. THECLA, *Fabr., Horsfield.* Polyommatus, *Latr. et Godart.* Hesperia, *Fabr. olim.* Papilio (Pleb. rur.) *Drury.*

THECLA SIMAETHIS. Alis supra fuscis, nitidis, subtus flavo-viridibus, vittâ transversâ argenteâ, posticis apice ferrugineis strigâ è punctis margaritaceis. (Expans. Alar. 1 unc. 3 lin.)

SYN. Papilio (Pleb. rural.) Simaethis, *Drury, App. v.* 2. *Herbst. Pap. tab.* 289. *f.* 3. 4. *Fabr. Ent. Syst.* 111. 1. *p.* 286. *No.* 97. (Hesperia S.) *Latr. et God. Enc. Meth.* 9. 643. 97. (Polyommatus S.)

HABITAT: Saint Christopher's (*Drury*). Surinam (*Fabr.*).

Upper Side. The wings are brown, tinged with blue. The cilia white, posterior wings with two tails like hairs, of a chocolate colour; the tips being white.

Under Side. The anterior wings are green next the anterior edge, but along the interior one are of a greyish flesh colour. A narrow silver line begins at the anterior edge, about a third from the tips, and crossing both superior and inferior wings, meets near the extremity of the abdomen, running across the inferior wings in a very irregular, indented manner, and having its upper side verged with chocolate. The

posterior wings, above this line, are of a deep pea-green; but below it soften into a flesh colour, which continues along the external edge, from the upper to the anal corner; whence rises a jagged, indented, chocolate line, that runs across the wing, parallel with the silver line, whereon are several dark blue spots, shining like polished steel.

Nearly allied to the common British species, Thecla Rubi.

POLYOMMATUS THERO.

Plate II. fig. 1.

ORDER: Lepidoptera. SECTION: Diurna. FAMILY: Lycænidæ, *Leach.*

GENUS. POLYOMMATUS, *Latreille et Godart.* Lycæna, *Fabr.* (Syst. Gloss. Synops. in Illig. Mag.) Papilio (Nymph. Phalerat.) *Drury.* (Pleb. rural.) *Linn.*

POLYOMMATUS THERO. Alis dentatis, suprà nigricanti-fuscis, fúlvo maculatis, posticis subtùs nebuloso-cinereis maculis linearibus nitenti-albis, maculâ disci majori, apicibus uncinatâ. (Expans. Alar. lin. 1 unc. 9 lin.)

SYN. Papilio (Pleb. rur.) Thero, *Linn. Syst. Nat.* 2. *p.* 787. *No.* 219. *Fabr. Ent. Syst.* III. 1. *p.* 274. *No.* 57. (Hesperia rural.). *God. et Latr. Enc. Meth.* 9. 662. *No.* 154.
Hesperia Erosine, *Fabr. Ent. Syst.* III. 1. *p.* 266. *No.* 28.
Papilio Salmoneus, *Cramer, Ins. t.* 1. *pl.* 2. *f.* 1.
Papilio Rumina, *Drury,* (exclus. syn. Linn.)

HABITAT: Cape of Good Hope.

Upper Side. The wings are dentated, and of a fine dark brown colour. The anterior having seven square discoidal red spots, of different sizes. The posterior ones are furnished with four short tails, two on each; above which are three small red spots.

Under Side. The anterior wings are red at the base; but along the external and interior edges are of a rusty grey brown, with several dark marks or clouds thereon. Near the anterior edge, towards the base, are three black spots, with three small white ones in their centres. The posterior wings are of a rusty grey brown, darkest in the middle, with a margin of a paler colour, running along the external and part of the upper edges. Several spots, of a silver white, are dispersed on different parts of the wings; some being round, long, triangular, &c. About the middle of each wing is a long silvery mark, running in a direction from the base to the external edge; being about half the length of the wing.

Drury confounded this species with the European Papilio Rumina, Linn. belonging to a distant genus (Thais), whilst Fabricius described it twice under the specific names cited above.

ERYCINA LYSIPPUS.

Plate II. fig. 2.

ORDER: Lepidoptera. SECTION: Diurna. FAMILY: Lycænidæ?

GENUS. ERYCINA, *Latr.* Hesperia (rurales), *Fab.* Papilio (Pleb. rur.) *Linn. Drury.*

ERYCINA LYSIPPUS. Alis fusco-nigris, singularum utrinque fasciâ tenui aurantiacâ; posticis angulatis, subtùs ad basin griseo maculatis. (Expans. Alar. 1 unc. 6 lin.)

SYN. Papilio (Pleb. rur.) Lysippus, *Linn. Syst. Nat.* 2. *p.* 793. *No.* 250. *Cramer, pl.* 380. *f.* A. *Fabricius Ent. Syst.* III. 1. *p.* 321. *No.* 218. (Hesperia rur. L.). *Latr. et Godart, Encycl. Méthod.* IX. *p.* 566. *No.* 11. (Erycina L.)

HABITAT: Jamaica (*Drury*). Guiana and Brazil (*Latr. et God.*).

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Upper Side. The wings are of a chocolate-black. On the anterior is an orange-coloured line, which, rising about the middle of the anterior edge, crosses the wing towards the anal angle, where it suddenly bends, and terminates at the posterior edge. The posterior wings, which are angulated, have a circular orange line, rising at the anterior edge, near the corner, crossing the wings, and meeting near the anal angle.

Under Side. The wings are of the same colour as on the upper side, with the same orange line, whereon, in the anterior pair, are some white spots. Between this and the base are several faint, dirty grey, oblong spots, namely, four on the anterior, and about twenty on the posterior wing. The base of the anterior margin of the fore wings, and the anal margin of the posterior wings, are of a red colour.

HIPPARCHIA EUMEA.

Plate II. fig. 3.

ORDER: Lepidoptera. SECTION: Diurna. FAMILY: Nymphalidæ, *Swainson.*

GENUS. HIPPARCHIA, *Fabr.* Satyrus, *Latr. et God.* Papilio (Danai Festivi), *Drury.*

HIPPARCHIA EUMEA. Alis integris subfuscis, anticis utrinque strigâ latâ fulvâ, subtus serie communi punctorum alborum. (Expans. Alar. 3 unc.)

SYN. Papilio (Dan. Festiv.) Eumeus, *Drury, App. to v.* 2. (1773). *Cramer, pl.* 183. *fig.* C. D.
Pap. (Nymphal.) Gripus, *Fabr. Ent. Syst.* 111. 1. 149. *No.* 457. *Herbst. Pap. tab.* 135. *No.* 3. 4.
Satyrus Gripus, *Latr. et God. Enc. Méth. v.* ix. *p.* 497. *No.* 70.

HABITAT: China (*Drury*). India (*Fabricius*).

Upper Side. The wings are entire, and of a deep brown, with a broad luteous fascia, rising near the anterior edges of the fore wings, running along near the tips, and ending at the external margin.

Under Side. The wings are the same colours as on the upper side. The anterior, with five whitish spots on each, placed in a row, near the external margin. The posterior have on each sometimes five, and sometimes seven spots, of the same colour, placed in a circular row, meeting near the extremity of the body.

I have reverted to the name given by Drury, in preference to following Fabricius, and the authors of the Encyclopédie Méthodique.

NYMPHALIS (CHARAXES) ATHAMAS.

Plate II. fig. 4.

ORDER Lepidoptera. SECTION: Diurna. FAMILY: Nymphalidæ, *Sw.*

GENUS. NYMPHALIS, *Latr.* SUBGENUS. Charaxes, *Boisduval.* (See page 1.)

NYMPH (CH.) ATHAMAS. Alis supra nigris, utrinque fasciâ mediâ latâ glaucâ subhyalinâ, subtus lunulis ferrugineis marginatâ. (Expans. Alar. 3. unc.)

SYN. Papilio (Equit. Achiv.) Athamas, *Drury, App. v.* 2. *Cramer, Pap. pl.* 89. *f.* C. D. *Encycl. Méthod.* 9. 353. (Nymphalis A.)
Papilio Pyrrhus, *Donovan. Insects of India, pl.* 4. *f.* 2. (excl. syn. Linn.)

HABITAT: China (*Drury*). India (*Donovan*). Java (*Latr. et God.*).

Upper Side. The head is brown, with four minute yellow frontal spots. The wings are dentated, and of a fine red brown, each with a broad brimstone coloured bar, rising near the middle of the anterior wings; and, crossing them and the posterior ones transversely, meeting near the extremity of the body.

Above these, near the tips, are two small oval spots of the same colour. The posterior wings have four tails, of nearly equal length, above which are seven small brimstone spots, placed on each, along the external edge.

Under Side. The broad transverse bar is of a pearl colour, being surrounded next the body by a narrow red brown border, edged with black, between which and the base, are two small black spots. The two spots, near the tips, are also seen on this side, being of a pearl colour. The external edges of the anterior wings are of an olive colour; the remaining parts being of a very resplendent greyish purple. Several small kidney-shaped marks are placed along the outer side of the pearl bar. The posterior wings have a narrow orange-coloured border running along their external edges; and above it, are seven small black spots, edged at the top with white. Above these is a shade of brown olive, over which are some black angular marks, with red crescents above them.

Donovan has confounded this species with the Linnæan Pap. Pyrrhus, although Drury had previously pointed out the diversity of the two species.

EREBUS ODORA.

Plate III. fig. 1.

ORDER: Lepidoptera. SECTION: Nocturna. FAMILY: Noctuidæ.

GENUS. EREBUS, *Latr.* Thysania, *Dalm.* Noctua, *Fabr.* Phalæna (Attacus), *Linn. Drury.*

EREBUS ODORA. Alis dentatis fuscis, nigro undatis, anticis ocello atro auriformi fulvo marginato; posticis sesquialtero. (Expans. Alar. 7½ unc.)

SYN. Phalæna (Attacus) Odora, *Linn. Syst. Nat.* 2. *p.* 811. *No.* 11. *Sloan. Jam.* 2. *t.* 230. *f.* 13. 14.
Noctua Odora, *Fabr. Ent. Syst.* 111. 2. *p.* 10. *No.* 8. *Gmelin, Linn., S. N.* 2529. 11. *Cramer, Ins. tab.* 169. *fig.* A. B. *Oliv. Enc. Méth.* 8. 252. 7.

HABITAT: Jamaica, Antigua, and other West Indian Islands (*Drury*). Surinam (*Fabricius*).

Upper Side. The body and wings are of a dark brown. The latter are scolloped, the anterior having, near their anterior margin, towards the middle, a black eye on each, shaped like a human ear, whose iris is of a dark orange colour; and, near the anal angle, towards the external edge, is a black scolloped line, running half way up the wing, joining to which (under it) is a bar of a very soft and delicate brown colour, differing from the general tint of the wings. The posterior wings have, on each, near the external edge, a mark somewhat like a large eye; upon whose under edge are two semi-eyes, one black, the other the same colour as the wings. Many agreeable shades, of a lighter colour, and ingrailed lines, run across all the wings.

Under Side. The head, breast, and legs, are the same colour as the upper side; except the thighs of the fore legs, which are red. There is very little variety of colours on this side, except a purplish hue, visible when held in a declining direction.

Drury notices another insect, also received by him from Saint Christopher's, of smaller size, and differing only in having a narrow indented bar, of a flesh colour, crossing the upper and lower wings, and which, he thinks, may possibly be the other sex of the insect here figured; considering also, that the references to Linnæus and Sloane, apply rather to the smaller insect. Fabricius states, that the female of Odora is distinguished by having a fascia, composed of three waved white lines, in the middle of the wings.

SPILOSOMA ACREA.

Plate III. fig. 2. ♀. 3. ♂.

ORDER: Lepidoptera. SECTION: Nocturna. FAMILY: Arctiidæ, *Steph.*

GENUS. SPILOSOMA, *Stephens.* Arctia p. *Schrank.* Eyprepia p. *Ochsenheim.* Bombyx p. *Fabr.*

SPILOSOMA ACREA. Alis niveis (posticis ♂ fulvis), punctis nigris, costalibus majoribus; abdominis dorso fulvo nigro maculato. (Expans. Alar. ♂ 2 unc.—♀ 2¼ unc.)

SYN. ♀ Phalæna (Bombyx) Acrea, *Drury, App. v.* 2.
♂. Phal. (Bomb.) Caprotina, *Drury, App. v.* 2.
Bombyx Acria, *Fab. Ent. Syst.* III. 1. *p.* 451. *No.* 137. *Abbot and Smith, Ins. Georg. tab.* 67. (exclus. *Syn. Fabr.* B. lubricipidæ).
Arctia Pseuderminea (*Peck*), *Harris in Massachus. Agricult. Repos. vol.* 7. *p.* 328. *and tab. annex.*

HABITAT: New York, Maryland, Virginia (*Drury*).

MALE.—*Upper Side.* The antennæ and eyes are black; the thorax and extremity of the body cream colour; the abdomen yellow, spotted on the top and sides with black. The anterior wings are cream coloured, spotted with black. The number of spots very uncertain, except five which are placed on the anterior edge, and six on the external one. The cilia yellow, as are the posterior wings, on each of which are three black spots, two near the external edge, and one near the middle.

Under Side. The breast and thighs are yellow; the abdomen and legs the same, chequered and spotted with black. All the wings are yellow, spotted in the same manner with black, as on the upper side.

FEMALE.—*Upper Side.* The head and thorax white. The abdomen yellow, with black spots on the sides and top, the extremity being white. All the wings are white, with black spots, whose number is very variable; but, on the anterior edges of each anterior wing, are placed five, and on the external edges, six.

Under Side. The legs are black and white, the thighs yellow; the abdomen white, spotted with black. All the wings are white, with black spots, most of which, observed on the upper side, being seen on this.

This species is closely allied to the common British species, Spilosoma lubricepida, and Menthrastri; but is of larger size, the spots being also larger. The two figures given by Drury, are now ascertained to be the sexes of the same species, as, indeed, our author had surmised might be the case. It appears to be a very common species, and is stated by Drury to breed twice a year, namely, in June and September. The caterpillar is very hairy, and when young is white; as it advances in age, it acquires a fox colour, and, in its last skin, becomes almost black. Dr. Thaddeus W. Harris, a distinguished American entomologist, to whom I am indebted for many valuable insects of that country, has published a very interesting notice, in the work above cited, upon this insect, under the title of "The Natural History of the Salt-marsh Caterpillar," under which name the larva of this insect is commonly known, and which is exceedingly destructive to grasses of various kinds. He states, that when nearly full-fed, "they become very voracious, and continue eating all the day and night without intermission. Soon they leave the meadows, aggregated in great numbers, and commence the wandering state, or begin to run, as is the phrase, devouring everything in their progress; corn-fields, gardens, and even the coarse and rank

produce of road sides, afford them temporary nourishment, until they have found a place of security from the wind and weather." Dr. Harris, in a communication to me, has stated, that he had ascertained that this insect was the Acria of Fabricius, and that Professor Peck's name must, therefore, be rejected. Abbot observes, respecting this caterpillar, that it is "a general devourer of all field and garden-plants, and weeds. It spun up in a thin web, intermixed with its own hairs, on the 16th of May, and the moth came out on the 2d of June. Others of the autumnal brood, taken in September, spun up on the 18th of that month, and remained in the chrysalis until the 21st of April."

CETHOSIA CYANE.

Plate IV. fig. 1.

ORDER: Lepidoptera. SECTION: Diurna. FAMILY: Nymphalidæ, *Swains.*

GENUS. CETHOSIA, *Fabr. Latr. et God.* Papilio (Nymphal. Phalerat.), *Drury.*

CETHOSIA CYANE. Alis dentatis nigris, lineâ communi tenuissimâ angulatâ marginali, anticis fasciâ posticis disco (nigro punctato) albis. (Expans. Alar. unc. 3¼.)

SYN. Papilio (Nymph. Phal.) Cyane, *Drury, App. v.* 2. *Herbst. Pap. tab.* 248. *fig.* 3. 4. *Cramer, Pap.* 25. *pl.* 295. *fig.* C. D. *Fabr. Ent. Syst.* III. 1. *p.* 115. *No.* 352. *Latr. et God. Encyl. Méthod.* ix. *p.* 247. (Cethosia Cy.)

HABITAT: Bengal (*Drury*). India (*Fabr.*).

Upper Side. The anterior wings are dentated and black: the anterior edge of a dirty olive brown; in the middle whereof a broad white bar arises, and runs transversely towards the middle of the external edge, where, stopping at the distance of a quarter of an inch, it forms, with some faint white spots, a black border along the external edge, whereon is a row of narrow white angulated marks. The posterior wings, which are deeply dentated, are white; with a deep black border running along the external edge, whereon is a row of white angulated marks, as on the superior wings, and above each of them is a series of short white streaks, running parallel with the edge of the wing. Above these are six round black spots, one situated between each nerve, and over them six more smaller, and fainter; several more spots being dispersed on the white parts of the wings, some very distinct, and others very faint.

Under Side. The anterior wings are red, which colour extends from the base nearly half along the wing, and which, towards the posterior edge, softens to a cream-colour. On this red ground are some short black lines, with blue ones between them, extending between the two principal nerves. The external edge has a black margin; whereon the white angular marks are seen more distinctly, being here shaped like beards of arrows. Above this border, near the external angle, are two oval black spots, or eyes, whose irides are white, having between them and the black border a row of small, round, black spots, placed close together. The white bar described on the upper side is also seen here. Several more black spots, of various forms, are dispersed on different parts, particularly a group in the centre of the wing. The inferior wings are white, with pale cream-coloured clouds; but next the base are white, blue, and red, with black streaks, from whence a shade of blue and brown runs along the anterior edge to the external angle, where a black border commences, whereon are angular white marks, like arrow beards or points. This border continues to the abdominal corners, where two small, curved, black lines meet together, and form an arch. Above the black border is a row of small black spots, and above them are six larger, with several others, of different shapes and sizes, dispersed on various parts of the wings.

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The insect described in the Encyclopédie Méthodique, from Malabar, differs from that figured by Drury, in having the disc of the posterior wings of a fulvous buff colour, and the spots larger, with the markings at the base of this pair of wings, on the under side fulvous instead of blue. Is this to be regarded as a variety, the opposite sex, or a distinct species?

CETHOSIA BIBLIS.

Plate IV. fig. 2.

ORDER: Lepidoptera. SECTION: Diurna. FAMILY: Nymphalidæ, *Sw.*

GENUS. CETHOSIA, *Fab. Latr. God.* Papilio (Nymphal. Phal.), *Drury.*

CETHOSIA BIBLIS. Alis subrotundatis dentatis fulvis, extimo fusco, lunulis albis anticarum serie triplici digestis (intermediâ minori), posticis ante marginem maculis nigris, singulis subtùs ad basin lineis maculisque flavis variis. (Expans. Alar. 3 unc. 9 lin.)

SYN. Papilio (Nymph. Phal.) Biblis, *Drury, App. v.* 2. (1773). *Cramer, Pap.* 15. *pl.* 175. *fig.* A. B. *Herbst. Pap. tab.* 248. *fig.* 1. 2.
Papilio (Nymph.) Penthesilea, *Fabr. Ent. Syst.* III. 1. *p.* 114. *No.* 349. (exclus. Syn. Crameri.)
Cethosia Biblina, *Latr. et God. Enc. Méth.* ix. *p.* 248.

HABITAT: China (*Drury*). From the collection of the late Mr. Lee of Deptford.

Upper Side. The anterior wings, next the shoulders, are a brown orange, occupying half the wings; the other half, next the tips, are of a rusty red brown, whereon is a row of white crescents running along the external edge. Above this are five white squarish spots, and over them a row of angulated marks, like points of arrows, with white spots in their centres, above which is a single white spot, between which and the shoulders are some short black waved lines, extending between the two principal nerves. The posterior wings are entirely of a brown orange, except a rusty red-brown border that runs along the external edge, whereon is a row of white crescents, and above it are six black spots running parallel with the border, beneath which is a denticulated line of dark brown.

Under Side. The anterior wings, next the shoulders, are of a brown orange, reaching half way along the wings, the remainder being rusty yellow. On the orange ground, next the shoulders, are several black, irregular, short lines, placed two and two, the middle, or spaces between them, being clay-coloured. Two small black spots are placed on the anterior edge, on each side near the base. Along the external edge is a row of white angulated lines, above which is a row of ash-coloured marks, with some dark spots thereon; and over this, is another row of ash-coloured marks, shaped like acute angles, with an oblong streak in the centre of each. The posterior wings at the base are dark orange, but toward the external edges are rusty yellow, on which is a row of crescents on a dark border. Above this is a circular bar or band of a flesh colour, having a row of dark spots on the lower edge, and the upper edge shaped like acute angles, with a black triangular mark in each, and a white spot in its centre. About a quarter of an inch above this bar is another of a clay colour, about one-eighth of an inch broad, with dark spots and marks on it, some of which resemble Greek characters. Over this bar is another near the base, of a clay colour, with a double row of black marks or streaks on it.

Fabricius has confounded this species and another, under the name of Penthesilea. Latreille and Godart have altered the specific name proposed by Drury to that of Biblina, "parce qu'il a été imposé ultérieurement à un genre de Lépidoptères diurnes." I have, however, restored the specific name of Biblis, because the same name, was not

proposed for a genus by Fabricius, until many years after the publication of Drury's work, in the Synopsis of the Systema Glossatorum, published in Illiger's Magazine; and because the employment of a proper name, like Biblis, for a species, even when previously used for a genus belonging to a perfectly distinct group, is not incorrect.

CYNTHIA HUNTERA.

Plate V. fig. 1.

ORDER: Lepidoptera. SECTION: Diurna. FAMILY: Nymphalidæ, *Swains.*

GENUS. CYNTHIA, *Fabr. Stephens.* Vanessa p. *Latr. et God.* Papilio (Nymph. Gemmat.), *Drury, Fabricius.*

CYNTHIA HUNTERA. Alis subangulatis dentatis fulvis, nigro variegatis; anticis apice productis albo maculatis; posticis infra ad basin griseo reticulatis, ad extimum ocellis duobus magnis notatis. (Expans. Alar. 2 unc. 9 lin.)

SYN. Papilio (Nymph.) Huntera, *Fab. Syst. Ent. p.* 499. *No.* 240. *Herbst. Pap. t.* 178. *f.* 5. 6. *t.* 179. *f.* 1. 2.
Abbot and Smith, Ins. Georgia, vol. 1. *tab.* 9.
Papilio (Nymph. Gemm.) Cardui Virginiensis, *Drury, App. v.* 2.
Papilio Iole, *Cramer, Pap.* 1. *pl.* 12. *f.* E. F.
Papilio Bella Donna Virginiana, *Petiv. Gaz. Dec.* 4. *tab.* 33. *fig.* 5.

HABITAT: New York, Maryland, Virginia (*Drury*). Brazil to Georgia (*Enc. Méth.*).

Upper Side. The base of the wings tawny orange; the anterior, dentated and angulated; the tips and external edges are brownish black, on which are five white spots near the external angle, the largest being round. The remainder of the wings is of a fine orange brown, with several black marks thereon, near the anterior edges. The posterior wings are a little dentated, and of a brown orange colour like the anterior, having five black spots placed near the external edge of each, two of which being larger than the rest have blue centres, below these is a black border, with a row of brown-orange crescents running along the middle. The cilia is black and white.

Under Side. The anterior wings at the base are greyish, beyond which they are beautifully adorned with rose-coloured and black marks, having three white spots on each near the external edge, with several clouds and marks of different colours placed at the tips and anterior edges. The posterior wings are of a beautiful agate colour, with many lines and narrow bars branching from, and intersecting one another under different directions (like lines in a map), so as to form spots and clouds of different shapes. Each wing has two eyes placed near the external edge, one larger than the other, the pupils being of a blueish hue and the irides black, the small one having a yellow circle within it; below these, a purple line runs parallel with, and near to the external edge.

The caterpillar of this insect is described by Drury as being green, with black rings round the body, and as feeding about New York upon the wild balsams, appearing about the latter end of July, or beginning of August. Once in about five or six years they are exceedingly plentiful, at other times very scarce; a peculiarity also noticed in the very nearly allied European species, Cynthia Cardui (the Painted lady), of which species, indeed, Drury appears to have regarded it as a geographical variety.

The caterpillar, according to Abbot, is of a brown colour, with the incisions, and a

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lateral line yellow; it has also two dorsal lines, formed of alternately white and red points; the head is black, and the spines, with which the body is armed, are of the prevalent colour of the surface. It feeds upon the Gnaphalum obtusifolium. The chrysalis is rather yellow, with black spots, and is assumed towards the end of April or beginning of May. The butterfly appears at the end of about ten days. It continues breeding during the summer, and is very commonly seen sucking up moisture from damp places near houses. The caterpillar folds and spins the leaves together, in the same manner as the English Painted lady, Cynthia Cardui.

PIERIS (THESTIAS) PYRENE?

Plate V. fig. 2.

ORDER: Lepidoptera. SECTION: Diurna. FAMILY: Papilionidæ, *Leach.*

GENUS. PIERIS, *Schrank, Latr. et God.* Pontia, p. *Ochsenh. Horsfield.* Papilio (Danai Candidi), *Linn. Drury.* Thestias, *Boisduv.* Teracolus, *Swains.*

PIERIS (THESTIAS) PYRENE. "Alis flavis primoribus apice (medio fulvo) nigris, subtus nebuloso maculatis. Habitat in China." *Lin. loc. cit. infra.* (Expans. Alar. 2 unc. 9 lin.)

SYN. Papilio (Dan. Candid.) Pyrene, *Linn. Syst. Nat.* 2. 762. 86? *Latr. et God. Enc. Méth.* ix. 120.
P. Evippe, *Lin. var. teste. Drury, App. vol.* 2.
Pap. (Dan. Cand.) Sesia, *Fab. Ent. Syst.* III. 1. 203. 636.
Thestias Pirene, *Boisd. Hist. Nat. Lep.* 1. *p.* 593. *No.* 3.

HABITAT: China (*Drury*). Asia (*Linn.*).

Upper Side. The anterior wings near the base are of a brimstone colour; the tips and external edges being of a dark brown, nearly black, surrounding a large patch of a fine orange. The posterior are of brimstone colour, with a border round their edges of dark brown. The male has not this border.

Under Side. Black; all the wings brimstone, without any marks, spots, or clouds whatever in the female, the male having its under side of a brighter yellow, with several reddish-brown spots on the inferior wings.

There is the greatest confusion respecting the specific names of this, and several nearly allied species, which would be very difficult to unravel. Drury considered this insect as a variety of Evippe, whilst Fabricius, Latrielle, and Godart, give it as identical with the Linnæan Pyrene, which opinion I have adopted, although I am by no means certain as to the identity of the species; the under side of the wings offering no trace of the central discoidal black spot existing in that species. M. Boisduval has not diminished the confusion, in his work just published, by giving a species from Guinea, under the name of Evippe (which Linnæus states is from China), with the erroneous observation, "Il est probable que les anciens auteurs auront confondu sous le nom d'Evippe trois ou quatre espèces *Africaines.*"—*Hist. Nat. Lépid.* 1. p. 574.

CYNTHIA LAOMEDIA.

Plate V. fig. 3.

ORDER: Lepidoptera. SECTION: Diurna. FAMILY: Nymphalidæ, *Swains.*

GENUS. CYNTHIA, *Fab.* Vanessa p. *Latr. et God.* Papilio (Nymph. Gemmat.), *Linn. Drury.*

CYNTHIA LAOMEDIA. Alis dentatis cinerascentibus lineis fuscis transversis undulatis ocellisque (quibusdam cœcis) serie posticâ digestis; anticarum sex, posticarum quinque. (Expans. Alar. 2 unc. 9 lin.)

SYN. Papilio (Nymph. Gemmat.) Laomedia, *Linn. Syst. Nat.* 2. 772. *No.* 145. *Fabricius, Ent. Syst.* III. 1. *p.* 98. *No.* 302. *Cramer, pl.* 8. *f.* 10. *Herbst. Pap. tab.* 174. *f.* 1. 2.

HABITAT: China (*Drury*). East India (*Linn.*). Java (*Enc. Méth.*).

Upper Side. The wings are of a greyish purple and a little dentated. The anterior have on each four irregular black lines, running from the anterior edge near the body half way cross the wings, and six eyes on each, near the external edge, whose irides are white, some of which are oval, and one, being larger than the rest, is filled up with black and red; some are very faint. The posterior wings have six oval eyes on each, with white irides; three of which are more distinct than the rest, two of them being filled up with red and black. Two dark irregular lines run along and near to their external edges.

Under Side. The wings are rather paler than on the upper side. A small irregular line begins about the middle of the anterior edge of the superior wings, and running cross them and the inferior ones, meets below the body. The anterior wings have a distinct dark spot, and also a faint one. The posterior ones have two distinct red and black spots, and another very faint.

ARGYNNIS NIPHE.

Plate VI. fig. 1.

ORDER: Lepidoptera. SECTION: Diurna. FAMILY: Nymphalidæ, *Swains.*

GENUS. ARGYNNIS, *Fabr. Latr. God.* Argyreus, p. *Scopoli.* Papilio (Nymphal. Phalerati), *Linn. Drury.*

ARGYNNIS NIPHE. Alis supra luteis nigro maculatis, anticis ad apicem cœrulescenti-nigris fasciâ albâ transversâ; posticis subtus viridi, argenteo, nigroque variis, strigâ quinque ocellorum notatis. (Expans. Alar. 3 unc. 9 lin.)

SYN. Papilio (Nymph. Phal.) Niphe, *Linn. Syst. Nat.* 2. 785. *No.* 208. *Fabr. Ent. Syst.* III. 1. *p.* 142. *No.* 436.

HABITAT: China.

Upper Side. The anterior wings near the base are of a brown olive. About half the wings (from the lower angle upwards) are of a dark blue, with many different shaped spots on them, and a white bar running from the anterior edge towards the external one, which, being intersected by the black tendons of the wing, appears like three steps. All the wings are dentated or scolloped. The posterior ones are of a clay colour, with many black spots on them, of various forms. A black border runs along the external edges, narrowed as it approaches the external angle, on which appear two rows of blue spots like crescents, whose convex sides are placed opposite each other.

Under Side. The white bar on the anterior wings appears as on the upper side, from whence to the tips is an olive colour, whereon are some silver spots; the remainder as on the upper side. The posterior wings are of an olive hue, finely variegated with some white silvery spots and marks. A line of this colour runs along the external edges almost close to the scollops, and above that are five round spots of a darker olive, with small white dots in their centres.

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ARGYNNIS TEPHNIA.

Plate VI. fig. 2.

ORDER: Lepidoptera. SECTION: Diurna. FAMILY: Nymphalidæ, *Swains.*

GENUS. ARGYNNIS, *Fab. Latr. God.* Papilio (Nymph. Phalerat.), *Linn. Drury.*

ARGYNNIS TEPHNIA. Alis subrotundatis dentatis, supra luteis nigro maculatis, posticis subtus viridi argenteo nigroque variegatis serie quinque ocellorum. (Expans. Alar. 3 unc. 3 lin.)

SYN. Papilio (Nymph. Phal.) Argynnis, *Drury, App. v. 2. Herbst. Pap. t. 254. f. 5. 6.*
Papilio Niphe, var. *Fabr. Ent. Syst.* III. 1. *p.* 142.
P. Niphe mas. *Cramer, Pap. 2. pl.* 14. *f.* D. E.
Argynnis Tephnia, *Latr. et God. Enc. Méth.* ix. *p.* 262. *No.* 18.

HABITAT: China.

Upper Side. The wings are of a brown orange, having many black spots, of different sizes and shapes on them. A black scolloped border runs along the external edges of the posterior wings, whereon are two rows of tawny red spots, appearing like crescents, with their convex sides placed against each other. All the wings are scolloped or dentated.

Under Side. The anterior wings, toward the body, are brown orange. The tips are of a yellowish flesh colour, with some olive spots on them, with black spots, as on the upper side. The posterior wings are of a yellow flesh colour, marked with some olive spots, and white marks, which seem of a silver hue. A margin of olive colour runs along the external edges, whereon is a row of flesh-coloured crescents (as on the upper side), with an intersected narrow line above them. Over these, are five round olive spots, of equal sizes, with a dot of silver in their centres.

The specific name given to this species by Drury, having the priority in point of date, would have been retained, had it not been identical with that of the genus to which it belongs. Engramelle and several other authors have, inadvertently, given it as an inhabitant of the south of Europe.

NYCTALEMON PATROCLUS.

Plate VII. fig. 1. (Upper Side). Plate VIII. fig. 1. (Under Side).

ORDER: Lepidoptera. SECTION: Nocturna. FAMILY: Uraniidæ, *Westw.*

GENUS. NYCTALEMON, *Dalman.* (Prod. Monogr. Castn.) Urania. Divis. C. *Latr. et God.* Papilio (Equit. Achiv. *Linn.*), Noctua, *Fabr.*
(SUBGENUS. Orontes, *Swainson, Zool. Illustr. 2d. series,* 125.)

NYCTALEMON PATROCLUS. Alis supra fuscis, subtus griseis fusco undatis, utrinque fasciâ communi mediâ rectâ albâ, posticis caudatis. (Expans. Alar. fere 6 unc.)

SYN. Papilio (Eq. Achiv.) Patroclus, *Linn. Syst. Nat.* 2. 749. *No.* 24. *Cramer, Pap. pl.* 198. *fig.* A. *pl.* 109. *fig.* A. B. *Herbst. Pap. tab.* 54. *fig.* 2. 3. *tab.* 55. *f.* 1.
Noctua Patroclus, *Fab. Ent. Syst.* 3. 2. *p.* 6. *No.* 2.
Urania Patroclus, *Latr. et God. Enc. Méth.* ix. 710.

HABITAT: China (*Drury*). Java, Amboyna (*Enc. Méth.*).

Upper Side. The antennæ are about an inch long, slender, setaceous, and gradually diminishing from the base to the extremities. The head is small. The thorax is clothed with long soft hair; and,

with the abdomen, is of a darkish brown. A remarkable straight narrow line, or bar, of a cream colour, arises from the middle of the anterior edge of each of the fore wings, and, crossing both anterior and posterior wings, ends at the abdominal edges, about half an inch below the abdomen; so that, when the wings are extended, as in the figure, these lines, with the anterior edges, form an equilateral triangle. The space within the triangle is dark brown; but the parts, near the shoulders, are lighter, having a greyish cast or hue, and contain many small transverse curved streaks, extending to the anterior edges, where they are large, black, and very conspicuous, like stripes. Some transverse markings of this kind, are dispersed on the posterior edges of the superior wings, and also on the abdominal edges of the posterior. On the outside the triangle, both on the anterior and posterior wings, is a fascia, of light brown, about half an inch broad, which deepens into a dark brown. On the posterior wings, after becoming dark, it softens again into the same light colour, continuing to the external edges. Each of these wings is ornamented with two tails, the inner ones the longest and near an inch in length, the tips of which incline towards each other; the lesser or outer tails, are about half an inch long, strengthened by the tendons of the wings passing through the middle of them; all of them being bordered with a soft ray of dark brown.

Under Side. The bars or lines, which form the triangle on the upper side, are not visible on this; but the inclosed triangular field appears of a light greyish brown, darker at the borders, and thickly beset with small brown streaks, parallel to each other, and surrounding the body. The costal nerve of the anterior wings composes an edging in each, about an eighth of an inch broad, which diminishes as it approaches the external angle, white, and beautifully marked with black streaks, but smaller than those seen on the upper side. Outside the triangle, both in the anterior and posterior wings, is a broad border of white, which softens into a brown, but lighter than that on the upper side. Both in the white, and in the brown, are some small dashes of black, very thinly dispersed. The internal margin of the posterior wings is furnished with a deep fringe, and the black marks situated below the abdomen, are larger and broader than those on the upper side. The tails are whitish, bordered with brown, and appear as on the upper side.

This is one of those anomalous forms, whereof examples occur in every tribe of animals, baffling the skill of the most profound systematists. By Linnæus, and many other authors, it was considered as a butterfly, and certainly the genus Urania (in which it is placed by Latreille), as we learn from Mr. W. S. MacLeay's valuable memoir upon that genus, published in the first volume of the Transactions of the Zoological Society of London, is composed of day-flying species. Fabricius, however, regarded it as a moth, belonging to the genus Noctua, and nearly related to the genus Erebus, of which the Erebus Odora, figured in the third plate of the present volume, is a conspicuous species; and when we examine the structure of the palpi, and the spurs upon the posterior tibiæ, we find good reason for adopting this relation, admitting, at the same time, that the group in question is one which, from its various affinities and analogies, it is very difficult to assign to any single section.

PL. VIII.

CALLIMORPHA PHYLLIRA.

Plate VII. fig. 2.

ORDER: Lepidoptera. SECTION: Nocturna. FAMILY: Arctiidæ, *Steph.*

GENUS. CALLIMORPHA, *Latr. Leach.* Hypercompa, *Steph.* Heraclia, *Hubner.* Phalæna Bombyx, *Drury.*

CALLIMORPHA PHYLLIRA. Alis anticis nigris lineis albidis apicalibus, literam B referentibus; posticis sanguineis maculis nigris. (Expans. Alar. 1 unc. 6 lin.)

SYN. Phalæna (Bombyx) Phyllira, *Drury, Append. v. 2. Olivier, Enc. Méth. 5. 94. 236. Abbot and Smith, Ins. Georg. tab. 64.*

HABITAT: New York; taken on the 12th day of July.

Upper Side. The antennæ are black, small, and thread-like, near half an inch long; the head and thorax cream-coloured. Behind the head are two black spots, and on the thorax are three others, longer, and running parallel with it. The abdomen is scarlet, and on each segment is a black mark, forming a row, united together in the middle. All the wings are entire. The anterior ones black, with cream-coloured cilia; the interior edge, and part of the anterior, next the body, are margined with cream colour. A line of the same colour, runs from the body, parallel with, and near to the posterior edge, quite to the external one, where, suddenly returning, in a zigzag manner, it ends at the anterior edge, near the tips, and forms two angles, like a B, with a line placed across its top, or upper part. The posterior wings are scarlet, having a thin border of black, running along their external edges, with four black spots above it, those nearest the abdomen, being in shape like hearts.

Under Side. Like the upper: but the colours are more faint and less distinct.

The caterpillar of this species is brown, with small dorsal and lateral diamond-shaped yellow spots, emitting fascicles of hairs. It feeds, according to Abbot, on the cross-wort, corn, peas, wheat, &c. One of the caterpillars spun up on the 4th of April, and the moth appeared on the 29th. Another spun up on the 27th of May, and came out on the 16th of June. It continues breeding during most part of the summer.

SPILOSOMA NAIS.

Plate VII. fig. 3.

ORDER: Lepidoptera. SECTION: Nocturna. FAMILY: Arctiidæ, *Steph.*

GENUS. SPILOSOMA, *Steph.* Arctia, p. *Schrank.* Eyprepia, p. *Ochs.* Phalæna (Noctua), *Drury.*

SPILOSOMA NAIS. Alis anticis nigris lineis tribus longitudinalibus fusco-fulvescentibus, duabus superioribus externè connexis, posticis pallidioribus margine irregulari nigro. (Expans. Alar. 1 unc. 9 lin.)

SYN. Phalæna (Noctua) Nais, *Drury, Append. v. 2.*

HABITAT: New York; taken on the 24th day of June.

Upper Side. The antennæ are black, and pectinated; the head and body are of a light yellowish brown. On the thorax are three black marks, running parallel with it, with several black spots on the abdomen. The anterior wings are black; the cilia of a light yellowish brown, which colour is continued along the interior edges, up to the body; some broad lines, of the same colour, occupy about two-thirds of the wing, running parallel with the anterior and interior edges. The posterior wings are of the same light yellowish brown, with a faint black spot on each, having a broad irregular border, of a faint black,

running along the external edges, being very narrow in the middle. All the wings are plain and entire.

Under Side. Exactly like the upper, but the colours are less brilliant.

This species is nearly related to our common British species, Spilosoma lubricepida.

GEOMETRA TRANSVERSATA.

Plate VIII. fig. 2.

ORDER: Lepidoptera. SECTION: Nocturna. FAMILY: Geometridæ, *Stephens.*

GENUS. GEOMETRA, *Linn. Stephens.* Ennomos, *Treitschke, Duponchel.*

GEOMETRA TRANSVERSATA. Alis angulatis fusco-fulvescentibus undique strigis minutis transversis fasciâque tenui communi obscurâ notatis. (Expans. Alar. 2 unc.)

SYN. Phalæna (Geometra) transversata, *Drury, Append. v.* 2.

HABITAT: New York.

Upper Side. The antennæ are filiform, half an inch in length. The head, thorax, abdomen, and wings, of a brown orange. All the wings are angulated and besprinkled with small short transverse streaks parallel to each other. A narrow brown line, beginning at the external angle of the anterior wings, and running in a transverse direction, crosses them and the posterior wings near the middle, meeting above the extremity of the abdomen.

Under Side. Exactly like the upper in every circumstance, except that the brown line is not to be seen.

This species seems nearly allied to the moths, which English collectors call the Thorns, and to which Stephens restricts the name of Geometra, but which M. Dupouchel terms Ennomos.

BUPALUS CATENARIUS.

Plate VIII. fig. 3.

ORDER: Lepidoptera. SECTION: Nocturna. FAMILY: Geometridæ, *Steph.*

GENUS. BUPALUS, *Leach.* Fidonia, p. *Treitschke.* Phalæna (Geometra), *Drury.*

BUPALUS CATENARIUS. Fronte fulvâ; alis albis lunulâ mediâ; anticis strigis duabus undatis (scil. ante et pone medium), posticis strigâ unicâ, nigris. (Expans. Alar. 1 unc. 9 lin.)

SYN. Phalæna (Geometra) catenaria, *Drury, App. v.* 2. *Fabr. Ent. Syst.* III. 2. *p.* 140. *No.* 41. *Gmel. Linn. S. N.* 2461; 660.

HABITAT: New York (*Drury*). "In Indiis" (*Fabr.*).

Upper Side. The head is orange-coloured; the eyes black; the antennæ are broad, and pectinated; the thorax white, with three spots of orange colour, one at each shoulder, the other at the base of the abdomen, where are two small black specks. The abdomen is white, and on each ring is a small black speck. The wings are white; and, on each anterior one, are two denticulated lines, running cross the wing, from the anterior to the interior edge, in a circular manner; the one near the base, the other

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near the external edge, which last forms, on each nerve, a small black speck like an arrow head. Between the two lines is a black spot near the anterior edge. The posterior wings have a similar line running cross them, from the anterior to the interior edges, in a circular manner, and, meeting a little above the extremity of the abdomen, with a black spot in each near the middle.

Under Side. Is similar to the upper, only the black spots are more conspicuous.

CERATOCAMPA IMPERIALIS.

Plate IX. fig. 1. 2.

ORDER: Lepidoptera. SECTION: Nocturna. FAMILY: Bombycidæ, *Steph.*

GENUS. CERATOCAMPA, *Harris, Append. to Hitchcock's Geology of Massachusets.* Cerocampa, *Kirby & Spence, Ind. Introd. to Ent.* Odonestis, *Germar. Stephens.* Lasiocampa, *Latr. Schrank.* Bombyx, *Fabr.*

CERATOCAMPA IMPERIALIS. Alis flavis, fusco irroratis et variegatis, omnibus infra maculâ discoidali subocellari fuscâ. (Expans. Alar. 4 unc. 9 lin. ♂.—6 unc. ♀.)

SYN. Phalæna (Attacus) Imperialis, *Drury, App. v. 2.*
Bombyx Imperialis, *Fabr. Ent. Syst.* III. 1. p. 435. *No.* 89. *Gmel. Lin.* S. N. 2417. 510.
Phalæna Imperatoria, *Abbot and Smith, Ins. Georgia, tab.* 55. *Oliv. Enc. Méth.* 5. 56. 116.
Bombyx Didyma, *Pal. Beauv. Ins. Lep. pl.* 20.

HABITAT: New York (*Drury*). India (*Fabricius*).

Upper Side. The antennæ are of a reddish colour, broad and pectinated, and, near the extremities, appear as if they were stripped of their comb-like appendages. The thorax and abdomen yellow, clouded with a light reddish-brown colour, inclining to crimson. The anterior wings are of a fine bright yellow, with several clouds on them of the same brown colour, whereof one takes its rise at the tips, and runs along the external edge to the lower corners, being narrower at the extremities than the middle, where it branches off, and unites to a large cloud near the shoulders. The yellow parts of all the wings appear as if sprinkled with dark irregular specks. The posterior wings are of the same bright yellow as the anterior, and have, in the middle of each, a small brown eye, with a lighter spot in its centre. An irregular bar of the same reddish brown colour crosses these wings, which, beginning at the outer angle, meets at the anal angle. The edges of all the wings are plain.

Under Side. The thorax and abdomen are yellow. All the wings are of the same yellow colour, and sprinkled with brown as on the upper side. The superior wings have on each a light reddish brown eye near the middle, with a light spot in the centre, and a round brown spot above it. The anterior margins next the body are of a reddish brown; and the same cloud that appears along the external edge of each wing on the upper side, appears also on this, but fainter. The inferior wings have a reddish brown eye in each near the middle, with a lighter spot in the centre, and of the same size as on the upper side.

The figure here given, is taken from the male; the female being much larger, expanding full six inches; the antennæ being thread-like, and not combed or pectinated as the male.

This species breeds twice in the year, namely in June and September. The caterpillar, according to Abbot, feeds on the plane-tree (Platanus occidentalis Linn.), oak, liquidambar, and pine trees. Some of them are of a tawny colour, others tawny and orange, others green. They are furnished with long rigid hairs, and the second and third segments of the body are also armed with two pair of short, erect, rugose horns.

This insect is placed by Mr. Kirby in his new genus Cerocampa, together with Phalæna regalis, Fabr. Mr. Kirby had, however, evidently in view the caterpillars of the latter insect, when he proposed this generic name, and which are armed with numerous, long, erect, rigid spines, those near the head being curved, and giving the insect somewhat the appearance of a cockatoo. This larva is figured by Abbot and Smith, pl. 61, and specimens, admirably preserved by Abbot, are contained in the collection of the Entomological Society of London, presented by Mr. Kirby. There is also considerable difference between the chrysalides of these two insects, that of imperialis being more elongate, with a bifid tail, and with transverse rows of short abdominal spines, of which the chrysalis of regalis is destitute. One of the caterpillars observed by Abbot, went into the ground on the 16th of September, and the moth came out on the 4th of July. They are extremely difficult to rear in confinement.

NOCTUA SQUAMULARIS.

Plate IX. fig. 3.

ORDER: Lepidoptera. SECTION: Nocturna. FAMILY: Noctuidæ, *Steph.*

GENUS. NOCTUA, *Auct.*

NOCTUA SQUAMULARIS. Alis cinereis, anticis fasciâ irregulari centrali ferrugineâ, lineis duabus externè cinctâ, posticis fasciis duabus obscuris. (Expans. Alar. 1 unc. 9 lin.)

SYN. Phalæna (Noctua) Squamularis, *Drury, Append. v.* 2.

HABITAT: New York; taken on the 11th day of May.

Upper Side. The antennæ are brown, like fine threads. The tegulæ of a pearl colour, standing up as if projecting from the back. The colours on the anterior wings are divided by a strong bar of a deep chocolate, running cross the wings near the middle, from the anterior to the posterior edges. This softens into a deep slate colour, covering that part of the wings down to the external edges. The part next the shoulders is of a light ash or pearl colour, whereon are two small black spots or stripes, situated near the anterior edge. On the dark part near the lower corner, run two small black irregular lines, from the posterior edge; one running cross the wing, the other only half across. The posterior wings are of a lightish brown, having two bars of a deep brown (almost black) rising from the abdominal edge, and crossing the wing upward, grow broader and fainter as they approach the middle and anterior edge.

Under Side. Is of a faint russet colour, having little or no marking thereon. All the wings are slightly dentated.

I am unable to ascertain to which of the modern genera of Noctuidæ, this and the following species are referrible.

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NOCTUA UNDULARIS.

Plate IX. fig. 4.

ORDER: Lepidoptera. SECTION: Nocturna. FAMILY: Noctuidæ, *Steph.*

GENUS. NOCTUA, *Auct.*

NOCTUA UNDULARIS. Alis subdentatis nigricantibus, strigis transversis undulatis circiter 8. (Expans. Alar. 2 unc.)

SYN. Phalæna (Noctua) undularis, *Drury, App. vol. 2.*

HABITAT: New York.

Upper Side. The antennæ are brown and thread-like. The head, body, abdomen, and wings are of a very dark brown, bordering on black, and appear somewhat glossy. All the wings are a little dentated, and on the anterior ones, from the base to the extremity, is a series of black indented lines or bars, whereof the last or outer one is strong and conspicuous, crossing the wing from the anterior to the posterior edges, about a quarter of an inch from the external margin. The posterior wings are marked exactly like the superior.

Under Side. Is of a lighter colour, with the same kind of markings, but fainter.

NYMPHALIS FERONIA.

Plate X. fig. 1. 2.

ORDER: Lepidoptera. SECTION: Diurna. FAMILY: Nymphalidæ, *Swains.*

GENUS. NYMPHALIS, *Latr.* Papilio (Nymphales Gemmati), *Linn.* Papilio Satyrus, *Fabr.* (*Ent. Syst.*).

NYMPHALIS FERONIA. Alis subdentatis, supra cœruleo, fusco et albo marmoratis, omnibus ocellis sex iride simplici. (Expans. Alar. 3 unc. 6 lin.)

SYN. Papilio (Nymph. Gemm.) Feronia, *Linn. Syst. Nat.* 2. 770. *No.* 140. *Fabr. Ent. Syst.* 111. 1. *p.* 226. *No.* 710. *Cramer, pl.* 192. *fig.* E. F. *Herbst. Pap. tab.* 225. *fig.* 1. 2. *Latr. et God. Encycl. Méth. p.* 428. (Nymphalis F.).

HABITAT: Surinam (*Drury*). India (*Linn. Fabr. incorrectly*).

Upper Side. Antennæ black, with two small white spots at their bases, on the front of the head, and two more close to the eyes, on the top of the head; likewise two on the neck, and two longer ones on the thorax. The thorax and abdomen of a very dark blueish hazel. Anterior wings, next the shoulders, of a dark blueish hazel, black at the tips and outer margin, where are many different shaped flesh-coloured spots; the parts nearest the shoulders having many denticulated marks and dashes of a blue colour; some being also scattered all over the wings. About a third from the shoulder, near the anterior margin, on each wing, is a short, red, crooked line, which is seen on the under side. Near the outer margin are five ash-coloured spots, all of them being encircled with black, and some being edged with blue. Posterior wings of the same dark hazel as the anterior; the external edges being black between the scollops. Each wing is divided into a number of small different shaped spots margined with blue; and near the external margin are six black spots, whose irides are blue, having white ones in their centres. Below these is a double row of blue marks, like beards of arrows, placed on the black marks between the scollops. All the wings are dentated.

Under Side. Anterior wings whitish, about a third part at the base; the remainder being a dark chocolate, with many different shaped ash-coloured spots. Near the external edges are five round ash-coloured spots on a row, one being placed above the rest. Posterior wings chiefly whitish, except at the

outer angle and external edges; the latter being alternately marked with dark chocolate and ash colour, near which is a row of four round ash-coloured spots, encircled with chocolate, and a small faint one near the anal angle.

PIERIS (IPHIAS) GLAUCIPPE.

Plate X. fig. 3. 4.

ORDER: Lepidoptera. SECTION: Diurna. FAMILY: Papilionidæ, *Leach.*

GENUS. PIERIS, *Schrank. Latr. et God.* Colias, *Horsf.* Papilio (Danai Cand.), *Linn. Drury.* Iphias, *Boisduv.*

PIERIS (IPHIAS) GLAUCIPPE. Alis supra albis, anticis maculâ magnâ apicali (medio fulvo) nigrâ, subtus (nisi dimidio basali anticarum) cinereis strigis minutis fuscis irroratis. (Expans. Alar. 4 unc.)

SYN. Papilio (Dan. Cand.) Glaucippe, *Linn. Syst. Nat.* 2. 762. *No.* 89. *Fabr. Ent. Syst.* III. 1. *p.* 198. *No.* 618. *Cramer, Pap. pl.* 164. A. B. ♂. C. ♀. *Herbst. Pap. tab.* 96. *f.* 1—3. *Encycl. Méth.* ix. *p.* 119. (Pieris G.), *Boisduval, Hist. Nat. Lep.* 1. *p.* 596. (Iphias G.)
Pem. Pap. Callirhoe, *Fab. Mant. Ins.* 2. 20. 215.

HABITAT: China (*Drury*). Java (*Dr. Horsfield*). Bengal (*Boisduval*).

Upper Side. Head and neck light brown; thorax, dark blue, clothed with white hairs; abdomen white, with a blueish tinge. Anterior wings next the body white, occupying more than one half. The tips are black, which colour runs along the anterior and external margins, encircling a large spot of a deep orange, whereon are four small triangular black spots. Posterior wings wholly white, and very slightly dentated.

Under Side. The mouth, breast, and feet are ash-coloured. Anterior wings next the body white; the extremities of a deep flesh colour, sprinkled over with a great number of small dark brown streaks. Posterior wings of a yellowish flesh colour, and covered with small dark brown streaks.

M. Boisduval has formed the present species, and another large Pieridean, into the genus Iphias, which differs from Thestias, and Mancipium (Anthocharis Bdv.), in the structure of the antennæ. The larva and pupa of this species are described and figured by Dr. Horsfield, in his Lepidoptera Javanica, pl. 3, fig. 7, and 7 a, (copied by Boisduval, pl. 2 A. fig. 3.). The former is long subcylindrical, with the dorsal segments somewhat rugose, being transversely shagreened; it feeds upon the Capparis. The pupa is navicular, the head being produced into a point. The female imago differs from the figure here given (which represents the male), in having the black markings more diffused.

PAPILIO PHILENOR.

Plate XI. fig. 1. and 4.

ORDER: Lepidoptera. SECTION: Diurna. FAMILY: Papilionidæ, *Leach.*

GENUS. PAPILIO, *Auct.*

PAP. PHILENOR. Alis dentatis nigris, posticis caudatis virescenti-nitidis maculis albis, subtus maculis fulvis albo notatis serieque digestis. (Expans. Alar. unc. 3¾).

SYN. PAP. PHILENOR, *Linn. Mant.* (1771). 6. 535. *Fabr. Syst. Ent. p.* 445. *No.* 12. *Smith and Abbot, Ins. Georgia, Vol.* 1. *tab.* 3. *Encycl. Méth.* 9. 40. *Boisduval, Hist. Nat. Lepid.* 1. *p.* 324. *No.* 167. *Boisd. et Leconte, Icon. Lep. Amer. Sept. pl.* 11. *f.* 1—4. *Say, American Ent. Vol.* 1. *pl.* 1.

Pap. Astinous. *Drury, App. Vol.* 2. (1773). *Cramer,* 208. A. B.

HABITAT: North America, from New York to Georgia.

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Upper Side. Head and neck black, with two small white spots between the antennæ at their base, and eight more on the head and neck. Thorax black. Abdomen of a glossy hue. Anterior wings black, with a very glossy greenish tinge at the anterior angle, with eight small, white, narrow crescents on the external margin of each, which make them appear as if dentated. Posterior wings of a dark glossy green, with two tails issuing from them. The concave part of each scollop is edged with white; and six whitish spots run along their edges, meeting below the extremity of the body.

Under Side. Breast, legs, and abdomen black; the sides spotted with cream-coloured spots, one of which appears on the inferior wings, on each side the breast. Anterior wings, next the tips, are of the colour of soot; but next the body, black, with five whitish spots on the external margin, near the interior angle. The upper part of the posterior wings, next the body, are soot-coloured; the remaining parts of them being of a glossy blue, with seven dark orange spots, placed in a circular manner, a little distance from the edge, and meeting at the extremity of the body: each spot is encircled with black, except in that part where a small silver mark appears on its edge, being represented in the plate by white. The scollops are deeper edged on this side with white than on the upper.

This butterfly is one of the most beautiful, and, at the same time, most common of the North American species; abounding wherever the Aristolochia serpentaria grows, the larva feeding upon that plant. It is described by Boisduval and Abbot, and is brown, with four rows of small fulvous tubercles, and a row of brown spines near the legs; moreover, it has two long spines directed forwards upon the first segment, three upon the penultimate, and two upon the tenth segment. The neck is also furnished with a furcate retractile reddish tentacle; the chrysalis is of a violet grey, or reddish colour, with two yellow spots, the head being truncate. The female is larger, with brown-coloured wings, with cupreous reflections. The insect assumes the chrysalis state on the 26th of April, and the fly appears on the 4th of May. Another, observed by Abbot, went into chrysalis on the 21st of June, and the butterfly came out on the 5th July. The latter delights to frequent the blossoms of the peach and other trees in the spring.

PAPILIO ASTERIAS.

Plate XI. fig. 2. 3. and 5.

ORDER: Lepidoptera. SECTION: Diurna. FAMILY: Papilionidæ, *Leach.*

GENUS. PAPILIO, *Auct.*

PAPILIO ASTERIAS. Alis dentatis nigris, fasciâ maculari maculisque marginalibus flavis; posticis caudatis, angulo ani fulvo, puncto atro, abdominis dorso duplici serie punctorum flavorum. (Expans. Alar. 3 unc.6 lin.—4 unc.)

SYN. PAPILIO ASTERIAS, *Fabr. Mant. Ins. tom.* 2. *p.* 2. *No.* 13. *Ent. Syst.* III. 1. *p.* 6. *No.* 16. *Cramer, tab.* 385. *f.* C. D. *God. Enc. Méth.* ix. *p.* 58. *No.* 91. *Boisduv. et Lec. Icon. Lep. Amer. Sept. pl.* 4. *Boisd. Hist. nat. Lep.* 1. 332. *No.* 175.

Papilio Troilus, *Drury, App. Vol.* 2. *Abbot and Smith, Ins. Georg.* 1. *t.* 1. (*exclus. Syn. Linn. et Fabr.*).

HAAITAT: New York, Maryland, Carolina, Virginia (*Drury*).

Upper Side. Antennæ, head, and body black, with two yellow spots at the bases of the antennæ, and two more on the neck; the sides of the abdomen being spotted with two rows of the same. Ante-

rior wings black. A row of eight or nine yellow spots runs along each wing, near the external edge. Within these appears another row, smaller in figure 3, but larger in figure 2, and shaped like triangles, above which are two spots, one nearly round, the other very oblong, which last is not seen in figure 3. Posterior wings black and dentated, with one tail issuing from each. Six yellow spots appear near the external edge; and at the anal angle is an orange-coloured one, with a black dot in its centre. Some specimens have a yellow bar running transversely from the row of triangles on the superior wings, and meeting below the extremity of the body, just above the orange spot, as in fig. 2. In some, instead of a bar, is seen a row of spots (as in fig. 3), which are sometimes very faint. Where this happens, the space between this row and the six spots mentioned before, consists of a shining blue colour; but in proportion as the yellow bar is more or less distinct, the wings have more or less blue on them.

Under Side. The under side in all the different varieties differs but very little. The breast, sides, abdomen and feet are black. The anterior wings of a dirty black colour, with nine yellow spots near the external edge; above these, nearer the body, are eight others, varying in size, and two small clouds or patches close to the anterior edge. Posterior wings, next the shoulders, dirty black, with the inner scollops edged with yellow crescents (appearing also on the upper side), within which are six spots near the edge—four orange and two yellow. Seven or eight orange spots, tipped with yellow, run circularly across the middle of the wing. Below each spot in this row is a ray of shining blue, separated by a strong black mark, and scattered with powder-like spots. An orange spot, with a black centre, is placed at the anal angle.

This species is subject to considerable variation in the size of the internal series of yellow spots, which is sometimes even entirely obliterated in the females, in which the yellow is much less brilliant, and the spots smaller than in the males. These varieties somewhat resemble Papilio Troilus of Linnæus, with which, indeed, Drury and Smith* confounded the insect here described. Godart and Boisduval have added to the confusion by their incorrect references to our author, the first of these writers giving figure 2 of this plate as alone representing P. Asterias, and figs. 3, 4, and 5, (which represent two distinct species) as P. Troilus, Linn. which species Drury has not figured; and both of these authors quoting figure 2, both under Troilus and Asterias, although Drury expressly states, that the specimens figured at 2 and 3, were reared by him, with many other individuals, from chrysalides, sent from America by his correspondent, who assured him that they proceeded from the same brood. The preparatory states of P. Asterias are figured by Abbot and Smith, and Boisduval. The larva feeds upon Umbelliferæ, especially the fennel (Anethum fæniculum, Linn.), and Daucus Carota, and is very similar to that of Pap. Machaon, which species appears to be replaced in America by P. Asterias, and which makes its appearance in the perfect state three times in the year. Abbot states, that one of the caterpillars assumed the chrysalis state on the 12th of July, and the imago appeared on the 20th.

* Sir J. E. Smith states that the Linnæan cabinet does not contain a specimen of this insect, nor of the Ilioneus of "the Insects of Georgia," pl. 2, one of the figures of which was considered by Mr. Jones, the celebrated lepidopterist, to be the Linnæan Troilus. Nevertheless, on the authority of the Banksian cabinet labelled (from recollection alone) by Fabricius, Sir J. E. Smith gave the Asterias under the name of Troilus, and the true Troilus as a new species.

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PAPILIO PARIS.

Plate XII. fig. 1. 2.

ORDER: Lepidoptera. SECTION: Diurna. FAMILY: Papilionidæ, *Leach.*

GENUS. PAPILIO, *Auct.*

PAPILIO PARIS. Alis nigris, aureo-viridi pulverulentis, posticis caudatis supra maculâ magnâ discoidali cyaneâ ocelloque purpureo; subtus lunulis septem rufis. (Expans. Alar. 4 unc.—4 unc. 9 lin.)

SYN. Papilio (Equit. Troes.) Paris, *Linn. Syst. Nat.* 2. *p.* 745. *No.* 3. *Fab. Ent. Syst.* III. 1. *p.* 1. *No.* 1. *Cramer, pl.* 103. A. B. *Esper. Aus. Schmett. tab.* 2. *fig.* 1. *Boisduval, Hist. Nat. Lep.* I. *p.* 208.

HABITAT: China.

Upper Side. Head, thorax, and abdomen black, and beautifully powdered with fine green specks. All the wings are black, but have a greenish hue, occasioned by a multitude of powder-like specks of a fine green. On the posterior margin of the anterior wings, near the lower corner, arises a series of green spots, becoming weaker, disappearing near the middle of the wing, and composed of powder-like specks. Posterior wings scolloped or dentated, each furnished with one tail, each scollop being edged with white. At the anal angle, near the corner, is a deep red spot, shaped like a semi-eye, whose pupil is black; and towards the upper corner of the wing, is a large and very splendid blue spot, appearing in some directions of a saxon green colour, and diminishing to a line as it approaches the semi-eye, over which it extends in an arch-like form, being there of a fine green colour.

Under Side. It has apparently no palpi. Breast and abdomen of a very dark brown. The superior wings dark brown at the base; from the middle of the anterior edge of a dark ash colour, running towards the upper corner, the tendons between being dark brown, which unite together at the external edge. Posterior wings almost black, sprinkled, or finely powdered, with small grey specks near the abdomen; round the external edge is a series of eye-like rings of an orange colour, edged above with purple.

This very handsome species is often received from China, but in an imperfect condition. The female, according to Godart (Enc. Méth. ix. p. 67.) is the Papilio Bianor, Fabr. which has no trace of the shining green spot on the posterior wings. M. Boisduval, however, asserts, that this is not correct, and that the female differs only from the male in having the ground of the wings rather darker, and possessing a transverse interrupted fascia of green dots near the external margin of the upper wing; these being represented in Drury's figure, therefore indicate that his specimen was of the female sex.

Dr. Horsfield has figured another species from Java (Lepid. Javan. pl. 1. fig. 14.), differing very slightly from the preceding, under the name of Papilio Arjuna, of which he has also figured the larva and pupa (pl. 4. fig. 11.). The former has the three first segments of the body covered, as it were, with a leathery shield, elevated behind, and ornamented with several ocelli; the other segments are simple; the chrysalis is considerably curved, with the head bifid.

COLIAS (CALLIDRYAS) PYRANTHE, *var.*?

Plate XII. fig. 3. 4.

ORDER: Lepidoptera. SECTION: Diurna. FAMILY: Papilionidæ, *Leach.*

GENUS. COLIAS, *Latr. et God.* Papilio (Danai Candidi), *Drury.* Callidryas, *Boisduval.*

COLIAS (CALLIDRYAS) PYRANTHE. Alis albis, anticis supra puncto minuto discoidali apiceque nigris, margine interno penicillatis, subtus (nisi basi anticarum) flavescentibus strigis numerosissimis fuscis. (Expans. Alar. 3 unc.)

SYN. Papilio (Dan. Cand.) Pyranthe, *Linn. Syst. Nat.* 2. *p.* 763. *No.* 98? *Latr. et God. Enc. Méth.* ix. *p.* 97. (Colias P.), *Boisduval, Hist. Nat. Lepid.* 1. *p.* 611. (Callidryas P.)
Papilio (Dan. Cand.) Chryseis, *Drury, Append.* vol. 2.
Papil. Gnoma, *Fabr. Ent. Syst.* 111. 1. *p.* 210. *No.* 658?
Pap. Nepthe, *Fabr. loc. cit. p.* 120?

HABITAT: China.

Upper Side. Thorax of a blueish black, with white hairs. Abdomen white. Anterior wings white, with a small oblong black spot near the middle of each; black at the tips, which colour extends down the external edge to the interior angle, and also runs a little way along the anterior margin towards the body. Posterior wings white, without any marks or shades. The edges of all the wings are entire.

Under Side. Breast, feet, abdomen, and anterior superior wings white, being covered about a third part from the tips with small, longish, light-brown streaks, making that part appear of a pale yellow. Posterior wings of the same pale yellow with the small streaks. One sex is very remarkable for having a number of hairs growing on the posterior edges of the anterior wings, next the body; some of which are erect, some bending downwards, and some lying flat on the wing.

There is much confusion respecting the specific names of this and several other Asiatic species, as may be seen from the citations in the synonyms. I have followed the French authors in assigning Drury's insect to the Pyranthe of Linnæus, although that author describes his insect as having a discoidal red spot on each of the wings beneath. The species of this group are variable in the intensity of their markings, and the males are less strongly marked than the females; and as Drury's figure represents a male (distinguished by the bundle of hairs on the interior margin of the anterior wings) it may possibly be an extreme variety of the male of Pyranthe. Boisduval has indeed described another species of considerably smaller size, which is destitute of the discoidal spot (Call. minna), which also, he considers, may possibly be a variety of C. Pyranthe.

ARGYNNIS IDALIA.

Plate XIII. fig. 1. 3. ♀.—2. ♂.

ORDER: Lepidoptera. SECTION: Diurna. FAMILY: Nymphalidæ, *Swains.*

GENUS. ARGYNNIS, *Fabr. Latr. et God.* Argyreus, *Scop.* Dryades, *Hubn.* Papilio (Nymphales Phalerati) *Linn. Drury.*

ARGYNNIS IDALIA. Alis dentatis, anticis utrinque fulvis nigro-maculatis; posticis suprà nigro-cœruleis, punctorum serie duplici, subtùs fuscis costâ baseos maculisque 26 argenteis. (Expans. Alar. ♂. 3 unc. 6 lin.— ♀. 4 unc.)

SYN. Papilio (Nymph. Phal.) Idalia, *Drury. Herbst. Pap. tab.* 252. 253. *Cramer, pl.* 44. *fig.* D. E. F. G. *Fabr. Ent. Syst.* 111. 1. 145. *No.* 446. *Latr. et God. Enc. Méth.* ix. 263. (Argynnis Id.)

HABITAT: New York (*Drury*); taken on the 28th June. Jamaica (*Enc. Méth.*).

Upper Side. Head and thorax of a deep brown orange. Anterior wings of a dark orange, the anterior and external margins bordered with black; near the latter are eight white spots on the wings of the female. Above these, in the female, are five, and in the male six, round black spots; those of the latter being smallest. Several black waves and streaks are dispersed on other parts of the wings. Posterior wings of a fine dark blue, almost black, and slightly dentated; the anterior ones being entire. Near the external margin is a row of seven cream-coloured spots, which in the male are red. Above these, is another row of the same number of cream-coloured spots, situated near the middle of the wings. The base of these wings is covered with brown orange-coloured hairs.

Under Side. Head, breast, and feet dark blue, nearly black. Anterior wings dark orange, with some triangular silver spots placed along the external edges, whose upper points are edged with black, and are generally more distinct in the female than in the male. The several black waves and streaks seen on the upper side, are here more faint, some being scarcely visible. Posterior wings of a dark olive brown, with twenty-six different shaped silver spots on each; one of which, in the centre of the wing, is divided by a short black line.

PAMPHILA PHYLÆUS.

Plate XIII. fig. 4. ♂.

ORDER: Lepidoptera. SECTION: Diurna. FAMILY: Hesperiidæ, *Stephens.*

GENUS. PAMPHILA, *Fabr.* Hesperia (arbicolæ), *Fabr. Latr. et God.* Papilio (Pleb. urb.) *Drury, Linn.*

PAMPHILA PHYLÆUS. Alisrufo-fulvis, anticis supra fasciâ obliquâ interruptâ (mas.) maculâve arcuatâ (fœmina) limboque postico fuscis, posticis ibidem extùs fusco marginatis. (Expans. Alar. 1¼ unc.).

SYN. Papilio (Hesp. urb.) Phylæus, *Drury, Latr. et God. Enc. Méth.* ix. *p.* 767. *No.* 112. (Hesperia Ph.)
Hesperia (urb.) Vitellius, *Fabr. Ent. Syst.* 111: 1. *p.* 327. *No.* 240.
Pamphila Vitellius, *Steph. Illust. Brit. Ent. H.* 1. *p.* 103. *Haworth, in Trans. Ent. Soc. Vol.* 1. *p.* 334. *Abbot and Smith, Ins. Georgia, tab.* 17.

HABITAT: Antigua, St. Christopher's, Nevis, &c. (*Drury*). Antilles and Brazil (*Enc. Méth.*).

Upper Side. Thorax and abdomen of a yellowish olive. Superior wings of a tawny yellow, having a dark brown (almost a black) indented margin, running along the external margin, from the tips to the lower corners. Near the middle of each wing are two dark-brown spots, one oblong, the other of a longish square form, the former being the largest. Inferior wings tawny yellow, and angulated, having a dark brown indented margin.

Under Side. Wings tawny yellow, but rather paler than on the upper side. The anterior with several dark brown angular spots, placed along the external edges, and in the middle of the wings, with a large one near the shoulders. Posterior wings also spotted with many small dark brown spots, some being scarcely visible.

A specimen of this species is stated to have been captured by the late Dr. Abbot in Bedfordshire. It is most probable, however, now that the Pamphila Bucephalus has been proved to be an indigenous species, that the specimen the capture of which is recorded by Mr. Haworth, belonged to that species. The caterpillar of this skipper-butterfly feeds upon a species of panic grass (Panicum Crus-Galli) and on the buffalo grass.

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NYMPHALIS BOLINA.

Plate XIV. fig. 1. 2.

ORDER: Lepidoptera. SECTION: Diurna. FAMILY: Nymphalidæ.

GENUS. NYMPHALIS. *Latr. God.* Papilio (Nymphal. Phal.), *Linn. Drury.*

NYMPHALIS BOLINA. Alis dentatis, supra nigris, anticis maculis duabus, posticis solitariâ magnâ, cœruleo-albis, subtus corticinis fasciâ albâ. (Expans. Alar. 3 unc. 6 lin.)

SYN. Papilio (Nymph. Ph.) Bolina, *Linn. Syst. Nat.* 2. *p.* 781. *No.* 188. *Cramer, pl.* 65. *fig.* E. F. *Herbst. Pap. tab.* 244. *fig.* 3. 4. *Fabr. Ent. Syst.* 111. 1. *p.* 126. *No.* 384. *Latr. et God.* (*Enc. Méth.*) ix. 396. *No.* 157. (Nymphalis Bol.)

HABITAT: Bombay, Surinam, all the West Indian Islands, New York, Carolina, Brazil, Cape of Good Hope, Malabar, Coromandel, China, Ceylon (*Drury*). "In Indiæ orientalis Portulaca" (*Fabr.*). Cayenne (*Enc. Méth.*).

Upper Side. Three white spots, one before, and two behind, on the head, which, with the thorax and abdomen, is of a blackish brown. Wings dentated, and of a dark chocolate colour, almost black; but when held against the light, in a certain direction, display a blueish purple. Anterior wings, in the middle, having a large oval, and another smaller oblong white spot at the tips. Posterior wings with a large white spot, larger than that in the superior ones. On the edges of all these spots, the purple colour before-mentioned, is very conspicuous.

Under Side. Palpi white. The sides of the thorax spotted with white. Anterior wings, next the body, of a reddish chocolate; but near the tips, of a dirty olive. The large and small white spots appear here as on the upper side; with three small angular white spots, close to the anterior margin, near the middle. Along the external edge, is a row of white crescents on a black border; over which are six small, round, faint, white spots. Posterior wings, next the body, of a dirty olive; but toward their external edges, more of a chocolate, with a broad central white bar running entirely across the wing, with a small angular black mark, near the anterior margin. Along the external edges, is a row of white crescents; above which is a row of small white triangular spots, placed two and two, between the crescents. Above this, six small round white spots are placed in a row.

The flight of this species is said by Drury to be exceedingly quick and rapid, so that it is very difficult to catch them, and hence they are seldom obtained in fine condition, being generally secured in a faded state when they are taken with more ease. The purple tint upon the upper side of the wings is most intense, and when the insect flies in the sun, glancing before the eye of the observer at a little distance (for it is by no means a timid creature), the vivid purple, observes Drury, is not much less than the electrical spark, and its changes depending on the degree of obliquity which it presents to the sun, are scarcely less rapid.

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NYMPHALIS IPHICLA.

Plate XIV. fig. 3. 4.

ORDER: Lepidoptera. SECTION: Diurna. FAMILY: Nymphalidæ, *Swains.*

GENUS. NYMPHALIS, *Latr. God.* Papilio (Nymph. Phal.), *Linn. Fabr. God.*

NYMPHALIS IPHICLA. Alis denticulatis, supra fuscis, fasciâ communi albâ antrorsùm rotundatâ, retrorsùm acuminatâ; anticis suprà maculâ apicis, et anguli analis, ferrugineis. (Expans. Alar. 2 unc. 9 lin.)

SYN. Papilio (Nymph. Phal.) Iphicla, *Linn. Syst. Nat.* 2. 380.
Papilio (N. P.) Iphicla, *Drury, App. v.* 2. *Fabr. Ent. Syst.* III. 1. *p.* 195. 417. *Cramer, pl.* 188. *fig.* E. F. (var.?)
Papilio Basilea, *Cram. pl.* 188. *fig.* D. (♂).
Papilio Cytherea, *Cram. pl.* 376. C. D. (♀).
P. Cythereus, *Herbst. Pap. tab.* 284. *f.* 1. 2.
P. Iphicla, *Herbst. Pap.* 148. *fig.* 3. 4.
Nymphalis Iphicla, *Enc. Méth.* ix. 374.

HABITAT: Surinam (*Drury*). Guiana and Brazil (*Enc. Méth.*).

Upper Side. Thorax and abdomen nearly black. Anterior wings of a light liver colour, having some faint lines a little waved, of a darker colour, running along the external edges. Each has an orange spot, situated at a small distance from the tip, and joining to the anterior margin. Posterior wings dentated, and angular at the anal angle, of the same colour as the anterior; with the same faint waved subapical lines. In the middle of the anterior wings arises a bar of a very pale brimstone colour, near a quarter of an inch broad, and which extends to the anal angle of the posterior wings, below which is an orange spot.

Under Side. All the wings, next the body, are marked and clouded with lines and marks of ash colour and olive brown. The pale brimstone bar is seen very distinctly on this side; and the two orange spots on the upper side of the anterior wings, here assume a tinge of flesh colour, separated in the middle by the tendon, which is of an orange cast. The faint waved lines also are very conspicuous, of a very dark flesh colour, shaded with brown.

VANESSA CHARONIA.

Plate XV. fig. 1. 2.

ORDER: Lepidoptera. SECTION: Diurna. FAMILY: Nymphalidæ, *Swains.*

GENUS. VANESSA, *Fabr. Latr. God. Curtis.* Hamadryades, *Hubn.* Papilio (Nymphalis Phal.), *Fabr. Drury.*

VANESSA CHARONIA. Alis dentatis, supra nigris, fasciâ communi submarginali cæruleâ, in posticis serie punctorum nigrorum divisâ; anticis apice productis, posticis subcaudatis. (Expans. Alar. 3 unc.)

SYN. Papilio (Nymph. Phal.) Charonia, *Drury, App. v.* 2. *Cramer, Pap. tab.* 4. *pl.* 47. *fig.* A. B. C. *Fabr. Ent. Syst.* III. 1. *p.* 119. *No.* 364. *Enc. Méth.* ix. *p.* 308. 27 (Vanessa Ch.).

HABITAT: China (*Drury*). India (*Fabr.*).

Upper Side. The thorax and abdomen black, and furnished with grayish hair. The ground of all the wings is black; but towards the body inclines to copper. On the anterior wings, near the tips, is a white spot placed close to the anterior edge. This edge is narrowly bordered with blue, and dappled with little wave-like stripes of black; from whose middle an oblique blue spot, almost half an inch long, extends down the wings. A little below this, arises a light blue bar of lunules, which runs even with the external edge, and is continued transversely across the posterior wing, excluding the anal angle. On this blue bar, in the posterior wings, are placed six small black angular spots. Beneath these is a

narrow double border of blue, running along their external margin. All the wings are deeply dentated and angulated.

Under Side. The ground of the wings is of a dark orange, with various broad transverse purplish shades, and with a variety of irregular small wave-like markings, and different tints of brown, intermingled with orange shades.

The under side of the male is of a very dark brown, almost black, with some faint wavings, which are not so strong and beautiful as in the female.

ARGYNNIS ERYMANTHIS.

Plate XV. fig. 3. 4.

ORDER: Lepidoptera. SECTION: Diurna. FAMILY: Nymphalidæ.

GENUS. ARGYNNIS, *Fab. Latr. God.* Argynnus, *Scop.* Papilio (Danai Festiv.), *Drury.*

ARGYNNIS ERYMANTHIS. Alis subrotundatis, subdentatis, fulvis, anticis fasciâ flavescenti transversâ mediâ nigro maculatâ, apice nigris; posticis serie punctorum, duabusque lunularum nigrorum. (Expans. Alar. fere 3 unc. [*Drury*], 2 unc. [*Enc. Méth.*]).

SYN. Papilio (Dan. Fest.) Erymanthis, *Drury, App. v.* 2. *Cramer, pl.* 238. *fig.* 9. *Fab. Ent. Syst.* III. 1. *p.* 139. 427. *Enc. Méth.* ix. 257.
Papilio Lampetia, *Cram. Pap. pl.* 148 *fig.* E.

HABITAT: China (*Drury*). Coromandel, Java (*Enc. Méth.*).

Upper Side. Head, thorax, and abdomen dark brown. Anterior wings, next the body, of a dark tawny orange, which colour occupies about half the wings, and is bounded by a very irregular line. A broad black patch occupies the tips of the wings, beginning about the middle of the anterior edge, and extends along the external one to the interior angle; on which, near the tips, are two clay-coloured round spots; and below them, in some specimens, are two more spots near the external edge. The space between the black patch and the tawny orange is of a clay colour, with three round black spots on it, the lower one the largest. Posterior wings tawny orange, the posterior edges being of a dirty brown; and above them are seen two rows of black crescents irregularly placed, over these are five round black spots. The wings are slightly dentated, the inferior ones most.

Under Side. All the wings clay colour. A dark, faint, engrailed line, composed of a number of crescents, joined together, runs transversely across the superior and inferior wings, extending to the anal angle.

HIPPARCHIA LEDA.

Plate XV. fig. 5. 6.

ORDER: Lepidoptera. SECTION: Diurna. FAMILY: Nymphalidæ, *Swains.*

GENUS. HIPPARCHIA, *Fabr. Stephens.* Satyrus, *Latr. et God.* Argus p. *Scop.* Orcades, *Hubn.* Papilio (Nymphales Gemmati), *Drury.*

HIPPARCHIA LEDA. Alis angulatis supra corticino-fuscis; anticis ocello apicis sesquialtero in plagâ magnâ luteâ, posticis ocellis duobus; omnibus subtus grisco-reticulatis strigâ ocellorum. (Expans. Alar. 3 unc.)

SYN. Papilio (Nymph. Gemm.) Leda, *Linn. Syst. Nat.* 2. 773. *No.* 151. *Drury, App. v.* 2. *Fabricius, Ent. Syst.* 3. 1. *p.* 108. 383. *Cramer, Pap. pl.* 196. C. D. *and pl.* 292. *fig.* A. *Encycl. Méth.* ix. 478. *No.* 4. (Satyrus L.)
Papilio Solandra (var.?) *Fabr. Ent. Syst.* III. 1. 106. 328. *Donovan Ins. New Holl. pl.* 23. *f.* 1.

HABITAT: China (*Drury*). Ind. orient. (*Weber MSS.*). Sierra Leone (*Fabr.* ??). Mauritius (*Encycl. Méth.*). Otaheite and New Holland (*Fabr. and Donovan*, P. Solandra).

Upper Side. Antennæ, thorax, and abdomen of a dark brown colour. All the wings dark olive brown. On the anterior wings, near the tips, are two black circular spots united together: the lower one being the largest, each having a small white one in its centre. On the posterior wings are two black circular eyes, towards the anal angle; their irides being of a gold colour, and the pupils white. The superior wings are a little dentated, the inferior ones being angulated.

Under Side. All the wings, on this side, are of a very pale brown, marked all over with short, crooked, wave-like stripes, of a dark brown colour, almost black. On the anterior wings are four eyes, the largest, situated near the middle of the wing, is encircled with yellow, its centre being white; below this is a small one, and two other small ones are placed near the tips. Posterior wings, with a row of six black eyes near the external edge, whereof two are much larger than the rest; the irides of all being yellow, and the pupils white. That next the anal angle is sesquialterate. In some specimens these eyes are less distinct than in others; in some there are not more than five to be discerned, and only one on each superior wing; in others not more than three can be distinguished, the small ones being entirely wanting.

Drury observes (Introd. to vol. iii. p. 16.) that this insect very much resembles a species sent by Mr. Smeathman from Africa, which comes out only about sunset, and is then to be found in dark shades, wavering about amongst the early flying noctuæ, and other nocturnal species. In some manuscripts of the late Professor Weber of Kiel, in my possession, the East Indies are given as the habitat of this species.

CASTNIA LICUS.

Plate XVI. fig. 1. 2.

ORDER: Lepidoptera. SECTION: Hesperi Sphinges (*Latr.*). FAMILY: Castniidæ. *Westw.*

GENUS. CASTNIA, *Fabricius, Latr. God. Dalman.* Papilio (Dan. Festiv.), *Drury.*

CASTNIA LICUS. Alis integris, supra atris nitidis; anticis sesquifasciâ albâ, posticis serie marginali punctorum rubrorum fasciâque obliquâ albâ. (Expans. Alar. fere 4 unc.)

SYN. Papilio (Dan. Festiv.) Licus, *Drury, App. v.* 2. *Cramer, pl.* 223. *fig.* A. B. *Fabr. Ent. Syst.* III. 1. *p.* 45. *No.* 137. (Licas.)
Papilio Lycus, *Herbst. Pap. tab.* 134. *f.* 1. 2. *Merian Surinam, tab.* 36.
Castnia Licus, *Latr. et God. Enc. Méth.* IX. *p.* 797.

HABITAT: Surinam.

Upper Side. The antennæ are dark brown, at the tips paler; and terminating in a point. The head, thorax, and base of the abdomen dark chocolate brown; the extremity and sides of the latter dark. Anterior wings of a fine deep chocolate brown. A narrow, irregular, and oblique cream-coloured bar runs across the wing; between this and the tip, from the anterior edge, runs another crooked irregular bar, of a much darker colour, reaching almost half across the wing towards the interior angle, the external margin being of a lighter shade. Posterior wings, having a white bar running transversely across the wing, widening by degrees, and ending at the anal angle. Six square orange spots also of different sizes, are placed within the external margin of these wings.

Under Side. Anterior wings, in the middle, dark chocolate; the tips dark fawn colour, lighter next the shoulders. The two irregular bars, on the upper side, are here a little broader. Within the external edge are three rather pearly white spots. Posterior wings greyish fawn colour, with the

external edges darker. A pale pearl-coloured bar runs across the wing beyond the middle, widening gradually; below this are some very faint brown spots, and near the external edge some faint orange ones, scarcely visible. The edges of all the wings are entire.

The genus Castnia is another of those curious anomalous forms, which exhibit the characters of several groups. The general form of the wings is that of a moth, whilst the variegated colours, indicating diurnal flight, and the structure of the antennæ are those of a butterfly. It is much to be regretted, that travellers in South America have not ascertained the preparatory states of this extraordinary group, which alone will enable us satisfactorily to ascertain its real relations.

GASTROPACHA? OTUS.

Plate XVI. fig. 3.

ORDER: Lepidoptera. SECTION: Nocturna. FAMILY: Bombycidæ, *Steph.*

GENUS. GASTROPACHA? *Ochsenh.* Sphinx, *Drury.*

GASTROPACHA? OTUS. Alis elongatis integris luteo-fuscis, anticis fasciis duabus denticulatis nigris. (Expans. Alar. 4 unc. 6 lin.)

SYN. Sphinx Otus. *Drury, Append. v.* 2.
Bombyx Agrius, *Oliv. Enc. Méth.* 5. 39. 56.

HABITAT: Smyrna *(Drury).*

Upper Side. The antennæ and head are of a reddish brown; the former are strongly pectinated, and very broad in the middle, but at the extremities very narrow and curled. Thorax dark brown. Abdomen reaching half an inch below the wings of a reddish dun colour. Anterior wings dun colour; with a large spot or patch, of a darker colour, situated on the posterior margin, near the base. Two indented black lines run obliquely from the anterior edge, near the tip, to the posterior near the middle; the space between them being rather lighter than the rest. Posterior wings dun colour, immaculate. All the wings, both on the under and upper sides, appear very shining and glossy; the scales or feathers appearing, when viewed through a microscope, very coarse and long. There is no tongue discoverable in this moth.

Under Side. Breast and sides bright dun. The abdomen reddish dun. All the wings dun-coloured. The lower indented line appears faintly through the wing, of a dark brown colour, also a faint reddish brown indented line runs across the posterior wings. The edges of all the wings are entire.

This insect, which appears to have been overlooked by modern authors, seems to form a connecting link between Zeuzera and Gastropacha, agreeing with the former in the general form, and with the latter in the transverse denticulated fasciæ on the anterior wings, and the curved antennæ feathered to the tips.

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PAPILIO POLYDAMAS.

Plate XVII. fig. 1. 2.

ORDER: Lepidoptera. SECTION: Diurna. FAMILY: Papilionidæ, *Leach.*

GENUS. PAPILIO (Equit. Troj.) *Linn.*

PAP. POLYDAMAS. Alis dentatis, nigro-virescentibus, fascia communi interrupta flava, posticis subtus maculis linearibus flexuosis rubris, tribus argenteis adjectis. (Expans. Alar. unc. 4.)

SYN. Pap. Polydamas. *Linn. Syst. Nat.* 2. 747. *No.* 12. *Merian. Surinam. pl.* 31. *Cramer Pap.* 18. *p.* 33. *pl.* 211. *f.* D. E. *Herbst. Pap. t.* 10. *f.* 6. 7. *Boisd. et Leconte Icon. des Chen. de l'Amer. Sept. pl.* 1. *Boisd. Hist. Nat. Lep.* 1. 324. *No.* 162.

HABITAT: America, from Georgia to Brazil, Antigua (*Drury*).

Upper Side. The head and thorax are black; with two red spots on the neck, and two small white spots at the base of the antennæ. All the wings are scolloped, and of a dark green colour. The anterior wings have a row of yellow spots rising near the tips, which, running across the middle of the inferior ones, in a circular manner, meet at the extremity of the body; some of them being shaped like the bearded points of arrows. The hollow or concave part of each scollop, in the inferior wings, is edged with yellow.

Under Side. The head, breast, feet, and abdomen are black; with several red spots on the sides, abdomen, and shoulders. All the wings are black; the anterior having some of the yellow spots that are seen on the upper side; with seven irregular red spots, placed along the edge of each posterior wing, and three silver spots or marks joining to the second, third, and fourth.

Linnæus states, that this insect inhabits the Hibiscus mutabilis. By other authors it is stated to feed upon the Aristolochia Serpentaria, or Virginian snake-root. The caterpillar is brown, with fleshy spines of the same colour, and red stripes, each segment also being ornamented with four eye-like spots, half yellow and half red.

NYMPHALIS ASSIMILIS.

Plate XVII. fig. 3. 4.

ORDER: Lepidoptera. SECTION: Diurna. FAMILY: Nymphalidæ, *Swains.*

GENUS. NYMPHALIS, *Latr. et God.* Papilio (Nymphalis Phal.), *Linn. Drury.*

NYMPHALIS ASSIMILIS. Alis subrepandis nigris coneoloribus, lineis maculisque albo-virescentibus, posticis strigâ apicali punctorum coccineorum. (Expans. Alar. fere 5 unc. [*Drury*] 3½ unc. [*Enc. Méth.*]).

SYN. Papilio (Nymphal. Phal) assimilis, *Linn. Syst. Nat.* 2. *p.* 782. *No.* 194. *Cramer, pl.* 154. A. *Esper. Pap. Exot. t.* 57. *f.* 1. *Fabr. Ent. Syst.* III. 1. *p.* 39. *No.* 114. (Papilio Eq. Ach.)

HABITAT: China.

Upper Side. Head black, with two white frontal spots. Thorax black, with three white stripes. Abdomen black, marked on the sides with white. Anterior wings sooty black, having a number of large spots and stripes on them of different forms and dimensions, of a greenish-grey colour. Near the external edge is a double row of sixteen small spots of the same greenish grey, and above them are five larger of a more circular shape. Posterior wings resemble the superior, but have a broad border of clearer black running along the external edge, whereon are five spots of a scarlet colour, inclining to pink, one having a small black spot in the middle. The wings are slightly dentated.

Under Side. Body black, and ornamented with round spots of clear white. At the base of the wings, is a remarkable round spot of a clear white, about the size of a pin's head. The wings are spotted as on the upper side, the greenish spots being rather larger, and in the inferior wings inclining to a yellow, the general ground of all the wings appearing more sooty on this side.

LIMACODES? ARENACEA.

Plate XVIII. fig. 1.

ORDER: Lepidoptera. SECTION: Nocturna. FAMILY: Bombycidæ.

GENUS. LIMACODES? *Latr.* Apoda, *Haworth.* Heterogenea, *Knoch.* Phalæna Bombyx, *Linn.*

LIMACODES? ARENACEA. Lutea, alis superioribus supra atomis nigris adspersis. (Expans. Alar. 1 unc. 3 lin.)

SYN. Phalæna (Bombyx) arenacea, *Linn. Syst. Nat. 2. p. 828. No. 65.*

HABITAT: Cape of Good Hope.

Upper Side. Antennæ pectinated, and of a yellow clay colour. The head and thorax yellow, but covered over with hairs in such manner that the former cannot be distinguished. The abdomen, superior and inferior wings yellow. On the anterior wings appear some very minute black spots scattered thereon in a very irregular manner. The wings are entire.

Under Side. The thighs, breast, and abdomen are very hairy. The superior and inferior wings of the same yellow colour as on the upper side, without a mark of any kind.

This insect appears most nearly to approach the genus Limacodes, *Latr.*

SATURNIA CECROPIA.

Plate XVIII. fig. 2.

ORDER: Lepidoptera. SECTION: Nocturna. FAMILY: Bombycidæ.

GENUS. SATURNIA, *Schrank. Latr.* Attacus, *Germar.* Phalæna (Bombyx), *Linn. &c.*

SATURNIA CECROPIA. Alis anticis subfalcatis, posticis rotundatis; omnibus griseis fasciâ communi fulvâ maculâque reniformi ocelloque apicali (in anticis) ornatis. (Expans. Alar. 6 unc. 6 lin.)

SYN. *Linn. Syst. Nat. v. 2. p. 809. No. 3. Cramer, Ins. 4. tab. 42. f. A. B. Catesby Carol. 86. t. 86. Abbot and Smith, Ins. Georgia, tab. 45. Fabr. Ent. Syst. 111. 1. p. 498. No. 4. Gmel. Linn. S. N. 2401. 3. Oliv. Ene. Méth. 5. p. 25. 5.*

HABITAT: New York (*Drury*). North America (*Linn. &c.*).

Upper Side. Antennæ very broad, pectinated and black. The head is small and red. Neck white. Thorax covered with long orange-brown hairs. Abdomen alternately with broad stripes of white and orange brown, the latter being edged behind with black. Anterior wings, with two bars crossing from the anterior to the posterior edges, one at about three-fourths of an inch from the shoulders, whitish, edged on the outside with black; the other is orange, at about an inch distance from the external margin. The base of the wing is a fine orange brown. The middle is deep rusty brown, which, towards the upper part, is powdered with buff-coloured hairs. In the middle of this is a large white spot verged with black, somewhat resembling a kidney bean, and is broadly tinged behind with red brown. The extremity of this wing, next the bar, is the same dark brown, and powdered, having a black spot about

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half an inch from the tip, having within it a semicircular mark of a pearl colour. From this spot to the anterior edge runs a serpentine line of white, bordered on the outer side with red. Between this and the orange bar is a broad tinge of light purple. The other side, next the tip, is light brown, stained with blood colour. From the black spot to the interior angle runs a black serpentine line, inclosing a space of dark buff, between which and the dark buff margin is a light buff irregular streak. Posterior wings similar to the superior, but the orange bar is redder and broader, running parallel with the external edge, and is bordered on the inner side with white; the part of the wing within this is deep rusty brown, with a larger white spot in the middle, verged with black, and tinged behind with red brown. The colour below the red bar is deep rusty brown, the border along the external edge being of a dark dirty buff, whereon are two small dark lines, having an irregular indented line of the same dirty buff above them. The wings are entire.

Under Side. The markings on all the wings are more distinct, and brighter than on the upper. The posterior wings, and the major part of the anterior, being covered with dust-like buff hairs, except the spots and buff margins round the edges. The posterior wings along the anterior edges being verged with white, which becomes broader as it approaches the shoulders.

The caterpillar of this fine moth feeds upon the wild American plum (Prunus Pensylvanica), garden plum, &c. It is thick and fleshy, of a pale green colour, with a pair of small blue spots on each segment, and with two rows of short and setose yellow dorsal tubercles. One observed by Abbot, spun up on the 17th of June, and the moth came out on the 30th of March following. The cocoon is attached to a twig. The outside web is coarse, and the inner covered with silk, like a silk-worm's cocoon. Abbot states that this silk has been carded, spun, and made into stockings, and that it will wash like linen. The species is, however, too rare to be of any utility in Georgia. It is, however, much more abundant in the neighbourhood of New York, and has been bred in England from some brought over in the chrysalis state. It is difficult to rear it in confinement.

SPILOSOMA ARGE.

Plate XVIII. fig. 3.

ORDER: Lepidoptera. SECTION: Nocturna. FAMILY: Arctiidæ, *Steph.*

GENUS. SPILOSOMA, *Steph.* Arctia, *Latr.* Eyprepia, p. *Ochs.* Phalæna (Noctua), *Drury.*

SPILOSOMA ARGE. Alis albidis, nigro-maculatis et lineatis, posticis incarnatis lineâ marginali fulvâ; abdomine concolori maculis nigris. (Expans. Alar. 1 unc. 9 lin.)

SYN. Phalæna (Noctua) Arge, *Drury, App. v.* 2. *Oliv. Enc. Méth.* 5. 92. 232.
Bombyx Dione, *Fabr. Ent. Syst.* III. 1. *p.* 442. *No.* 106. *Abbot and Smith, Ins. Georg. t.* 63.

HABITAT: New York; taken on the 20th day of May.

Upper Side. Antennæ filiform, and cream-coloured at the base, but black at their extremities. The tongue is small, and curled up. The neck red, having two small black streaks above it. The thorax and abdomen cream-coloured. On the former are three black streaks. On each annulus of the abdomen is a black spot, and another on each side. Anterior wings cream-coloured, with many black spots and marks thereon, of different forms and sizes, and varying very greatly in different specimens. The

anterior margin red. Posterior wings almost transparent, dirty cream-coloured, tinged with red, whereon are many oblong sooty spots. Ciliæ cream-coloured, within which is a narrow red line.

Under Side. The colours are more faint and dirty than those on the upper. Anterior femora red, with two black spots thereon, close to the head. Tarsi black and cream-coloured.

The caterpillar of this insect is brown, with five pale longitudinal lines, and with long hairs arising from fulvous tubercles. It feeds, according to Abbot, upon plantain, corn, peas, and many other plants. A specimen observed by this author was hatched on the 23d of July, spun up on the 28th of August, and the moth appeared on the 9th of September. It is said occasionally to make great devastation among Indian corn. Sir J. E. Smith ascertained the specific identity of this insect from Dr. Hunter's Museum, examined by Fabricius, who has neglected to cite Drury's figure.

SPILOSOMA CUNEA.

Plate XVIII. fig. 4.

ORDER: Lepidoptera. SECTION: Nocturna. FAMILY: Arctiidæ.

GENUS. SPILOSOMA, *Steph.* Arctia, *Latr.* Eyprepia, *Ochs.* Phalæna (Noctua), *Drury.*

SPILOSOMA CUNEA. Alis albis, anticis maculis permultis, posticis duabus nigris, abdomine concolori nigro-maculato. (Expans. Alar. 1 unc. 5 lin.)

SYN. Phalæna (Bombyx) Cunea, *Drury, App. v. 2.*
Phalæna punctatissima, *Abbot and Smith, Ins. Georg. t. 70?*

HABITAT: New York (*Drury*). Georgia and Virginia (*Abbot and Smith*).

Upper Side. Antennæ pectinated and black. There is no appearance of any tongue. Head white. Back and abdomen ash colour. Anterior wings white, with a great number of spots differently shaped of a sooty black colour. On the external margin are five spots, those nearest the tips being shaped like triangles. Posterior wings white, with a sooty spot on each near the external edge, and a very faint small mark near the exterior angle,

Under Side. Legs black. Breast and abdomen ash colour. The wings marked as on the upper side.

There seems little reason for doubting that this is identical with the Phalæna punctatissima of Abbot and Smith, of which the female is entirely white. The last named species feeds upon the mulberry, persimmon, willow, and wild cherry of America. One observed by Abbot spun up on the 16th of May, and came out on the 1st of June. The whole brood of caterpillars feed together in a web, and will often entirely destroy the leaves of a small tree. The name proposed by Drury evidently alludes to the triangular spots on the margin of the anterior wings, and seems quite as expressive as that employed by Sir J. E. Smith, who seems to have treated Drury's work on several occasions as scarcely deserving of notice.

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NOCTUA (ACONTIA?) NUNDINA.

Plate XVIII. fig. 5.

ORDER: Lepidoptera. SECTION: Nocturna. FAMILY: Noctuidæ, *Steph.*

GENUS. NOCTUA, *Auct.* (SUBGENUS, Acontia? *Ochsenh. Treit.*) Phalæna (Noctua), *Drury.*

NOCTUA (ACONTIA?) NUNDINA. Alis anticis pallide cinereis albido variegatis, literâ nigrâ ante apicem notatis. (Expans. Alar. 1 unc. 3 lin)

SYN. Phalæna (Noctua) Nundina, *Drury, App. v.* 2.

HABITAT: New York.

Upper Side. Antennæ thread-like, of a reddish brown. The tongue curled spirally. Head and thorax ash colour. Anterior wings the same, whereon are several faint marks of a light sand colour. Close to the anterior margin, about a third from the tips, is a black mark, resembling an J of the German text characters. Posterior wings silvery white, with a small, faint, light, sandy border, and a small oblong brown discoidal spot.

Under Side. Anterior wings silvery white, with a faint indistinct dark brown border running along the external margin, and two dark marks opposite the German text character. Posterior wings silvery white; the oblong brown spots are here plainly seen as on the upper side.

PAPILIO PALAMEDES.

Plate XIX. fig. 1. 2.

ORDER: Lepidoptera. SECTION: Diurna. FAMILY: Papilionidæ, *Leach.*

GENUS. PAPILIO, *Auct.*

PAPILIO PALAMEDES. Alis dentatis nigris, fasciâ maculari maculisque marginalibus flavis; posticis caudatis, his subtùs ad basin vittâ albâ transversâ rectâ lunulisque rufis. (Expans. Alar. 5 unc.)

SYN. Papilio (Eq. Achiv.) Palamedes, *Drury, App. v.* 2. (1773). *Cramer, pl.* 98. *fig.* A. B.
Pap. (Eq. Ach.) Calchas, *Fabr. Syst. Ent. p.* 453. *No.* 44. (1775). *Ent. Syst.* 3. 1. *p.* 30. *No.* 90. *Herbst. Pap. tab.* 42. *Boisduval, Hist. Nat. Lep.* 1. 337. *No.* 178. *Bdv. et Leconte, Icon. Lep. Amer. Sept. pl.* 5.

HABITAT: Carolina (*Drury*). Georgia, Virginia (*Bdv.*).

Upper Side. Head, back, and abdomen dark brown; the latter striped on the sides with yellow. Two yellow lines, beginning at the palpi, encircle the eyes, and, running along the shoulders, end at the base of the inferior wings. Anterior wings brownish black; the external margin with small yellow crescents, above which are nine yellow round spots. Above this is another irregular row of yellow angular spots. Posterior wings brownish black, each with a tail. Above it are six yellow spots, reaching from the anal to the upper corner, with five small blue spots above them, above which a yellow irregular bar runs across the middle of the wing, having a black spot, whose upper edge is verged with blue, placed at the anal angle, with a small tinge of orange above and below it.

Under Side. Breast and thighs yellow. Abdomen striped with yellow and dark brown. Anterior wings brownish black, with the same yellow spots and marks as on the upper side. Posterior wings brownish black, with six yellow spots near the external edge, having a mark of orange in the middle of each, above which is a row of orange crescents joined together, whose upper edges are silver, and below each of them is a black circular spot, whose inner part is a fine shining blue, from whence appears a great number of powder-like gray spots. The anterior edge next the shoulders, has a small orange streak, near which an orange-coloured line begins, running parallel with the abdomen.

The caterpillar is described by Boisduval as living upon several species of Laurus, and of a green colour, with pale blue spots, and scarlet belly and legs, with a scarlet eye-shaped spot on each side of the third segment. The chrysalis is gibbous, ferruginous on the back, with the belly rose-coloured, and four rows of pale blue dots. I have reverted to Drury's specific name, which has certainly the priority, as appears from the dates which I have introduced amongst the synonyms. Dr. Boisduval has given another species of this genus under the name of Palamedes, described by Fabricius under that name, but considered by him to be a Nymphalis. This latter species must consequently receive a new denomination.

MILITÆA PELOPS.

Plate XIX. fig. 3. 4.

ORDER: Lepidoptera. SECTION: Diurna. FAMILY: Nymphalidæ, *Swains.*

GENUS. MELITÆA, *Fabr.* Argynnis, *Latr. God.* Papilio (Pleb. rur.), *Drury.*

MELITÆA PELOPS. Alis subrotundatis, integerrimis, suprà fulvis nigro reticulatis; posticis subtùs carneis fusco undatis. (Expans. Alar. 1 unc.)

SYN. Papilio (Pleb. rur.) Pelops, *Drury, App. v.* 2.
Argynnis Pelopsa, *Latr. et God. Enc. Méth.* ix. *p.* 290. *No.* 62.

HABITAT: St. Christopher's (*Drury*).

Upper Side. Thorax and abdomen brown, the latter spotted with faint brown orange. Wings black, with several rows of large brown orange spots, crossing the wings, of different shapes and sizes.

Under Side. Anterior wings orange brown, spotted with black, having the appearance of indented lines running across them. Posterior wings dark flesh-coloured, marked and spotted with brown, and having five minute silver spots at equal distances, parallel with the external edge. The wings are entire.

HESPERIA ARCAS.

Plate XIX. fig. 5. 6.

ORDER: Lepidoptera. SECTION: Diurna. FAMILY: Hesperiidæ, *Steph.*

GENUS. HESPERIA, *Latr. Godart.* Battus, p. *Scop.* Papilio (Pl. ruric), *Linn.*

HESPERIA ARCAS. Alis nigricantibus immaculatis, margine integro, anticis subtùs margine interno dilutiore maculâ parvâ unicâ albâ. (Expans. Alar. 1 unc. 9 lin.)

SYN. Papilio (Pleb. ruric.) Arcas, *Drury. App. v.* 2.
Papilio (Pl. urb.) Philemon, *Fabr. Syst. Ent. p.* 534. *No.* 392. *Ent. Syst.* III. 1. *p.* 346. *No.* 314.
Hesperia Ph. *Latr. God. Enc. Méth.* ix. *p.* 788.
Papilio Elyas, *Cram. pl.* 328. E.

HABITAT: St. Christopher's.

Upper Side. Thorax and abdomen black. Wings very dark brownish black, immaculate. Margins entire.

Under Side. Legs, breast, and abdomen dark brown, but rather lighter than on the upper side, immaculate, except a small white spot on the anterior, placed near the anterior edge towards the tip.

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ALCOTT MUSEUM TESTIMONIAL

EREBUS CREPUSCULARIS?

Plate XX. fig. 1. 2.

ORDER: Lepidoptera. SECTION: Nocturna. FAMILY: Noctuidæ, *Steph.*

GENUS. EREBUS, *Latrielle.* Thysania, *Dalman.* Noctua, *Fabr.* Phalæna (Attacus), *Linn.*

EREBUS CREPUSCULARIS? Alis griseis, fasciâ maculisque albis, anticis ocello fusco, posticis fasciis duabus dentatis fuscis fulvo marginatis. (Expans. Alar. 4 unc. 3 lin.)

SYN. Phalæna (Attacus) Crepuscularis? *Linn. S. N.* 2. 811. *No.* 13. *Drury, App. v.* 2. *Oliv. Enc. Méth.* 8. 255. 19.

HABITAT: China (*Drury*). America (*Linn.*).

Upper Side. Antennæ setaceous. Palpi standing erect above the head. Tongue spiral. Neck with a narrow ring of white. Thorax dark brown. Abdomen dirty buff colour. Anterior wings dark nut brown at the base; paler at the external margin. On the anterior margin, next the tip, is a white subtriangular spot; and from the middle arises a white bar, which runs obliquely to the middle of the wing, but suddenly turns and runs to the base of the posterior margin; from the inner angle of this bar, near the middle of the wing, a black line runs towards the front of the wing, forming a large eye. Within the external margin are many dark and white marks. All the wings are scolloped. Posterior wings, next the shoulders, are of a dirty buff colour; remainder nut brown, separated by a narrow line of darker brown, beneath which runs a small narrow line of buff, and a quarter of an inch below this is another line, crossing the wing. From thence, to the external edge, are several darker coloured clouds, and white marks of different shapes and forms; particularly a white angular spot on the anterior edge, near the corner.

Under Side. All the wings of a pale clay colour, inclining to buff. On the anterior, the two white spots at the tips, visible on the upper side, appear here also; and several smaller ones on other parts of the wings. The white bar being less distinct than the other white marks; but on the posterior wings the white angular spot, near the upper corner, is very plain and strong.

The diversity of the habitats, given by Drury and Linnæus, render it doubtful whether that figured by the former be identical with that described by the latter.

NOCTUA LUNATA.

Plate XX. fig. 3.

ORDER: Lepidoptera. SECTION: Nocturna. FAMILY: Noctuidæ.

GENUS. NOCTUA, *Auct.* SUBGENUS. —?

NOCTUA LUNATA. Alis fuscis, strigis multis transversis; anticis maculâ centrali, alterâ angulatâ apicali, fasciâque obliquâ posticâ nigris. (Expans. Alar. 2 unc. 3 lin.)

SYN. Phalæna (Noctua) Lunata, *Drury, App. v.* 2.

HABITAT: Carolina, Virginia.

Upper Side. The antennæ light brown and setaceous. The tongue spiral. Palpi not very hairy. The head, thorax, abdomen, and wings hazel-coloured. Anterior wings with a waved line, of a dark brown colour, placed near the anterior angle, beginning at the posterior and ending at the external edge. At the shoulders, and along the anterior margin, are several small dark brown clouds and marks, that

produce a darker shade. Posterior wings with a series of narrow transverse waved lines, extending from the middle to the external edges. All the wings are dentated.

Under Side. The breast, abdomen, and wings are all of a paler hazel colour. Anterior wings dappled with dark brown on the middle of the anterior edge, and spotted with minute short brown streaks, as well as the posterior.

GEOMETRA (ANGERONA) SERRATA.

Plate XX. fig. 4.

ORDER: Lepidoptera. SECTION: Nocturna. FAMILY: Geometridæ, *Steph.*

GENUS. GEOMETRA. Subg. Angerona, *Duponch, Steph.* Hipparchus p. *Leach. Curt.*

GEOM. (ANGERONA) SERRATA. Alis luteo-fulvis dentatis, fasciâ latâ apicali maculâ basali anticarum fasciâque basali posticarum ferrugineis. (Expans. Alar. 2 unc. 3 lin.)

SYN. Phal. (Noctua) Serrata, *Drury, App. v.* 2.

HABITAT: New York; taken on the 26th of June.

Upper Side. Antennæ and head of a reddish buff colour, the former setaceous. Tongue very small and spiral. Thorax and abdomen yellow buff colour; as are all the wings in general. The anterior having a bar of brown red colour, which begins at the tips, and runs across the wings, almost to the middle of the posterior edge; occupying all that space along the external margin. At the base is a small cloud of the same colour, but much fainter. Posterior wings with a broad marginal bar of the same brown red. A small faint line likewise crosses these wings. The buff ground is sprinkled all over with faint, irregular, dark brown spots, that in some specimens are scarcely visible. All the wings are dentated; the lower ones most deeply.

Under Side. Wings yellow buff, with brown red markings, as on the upper side, but less distinct. The irroration stronger and plainer, being also sprinkled over the brown bars.

ARGYNNIS PHALANTA.

Plate XXI. fig. 1. 2.

ORDER: Lepidoptera. SECTION: Diurna. FAMILY: Nymphalidæ, *Swains.*

GENUS. ARGYNNIS, *Fabr. Latr. et Godart.* Argyreus, *Scop.* Dryades, *Hubn.*

ARGYNNIS PHALANTA. Alis subdentatis, fulvis nigro maculatis, posticis subtus ad extimum argenteo-purpurascentibus, ocellis aliquot fulvis. (Expans. Alar. 3 unc.)

SYN. Papilio (Nymph. Phal.) Phalanta, *Drury, App. v.* 2. *Fabr. Ent. Syst.* 111. 1. *p.* 149. *Latr. et God. Enc. Méth.* ix. *p.* 259. Papilio Columbina, *Cram. pl.* 337. D. E. (♂) *pl.* 238. A. B. (♀).

HABITAT: China (*Drury*). East Indies (*Fabricius, &c.*). Isle Mauritius (*I. O. W.*).

Upper Side. Thorax and abdomen of a dirty clay colour. Anterior wings of a fine deep clay colour, the tips being of a dirty black; which colour is continued, by irregular and indented marks, along the external edges, almost to the interior angle, where are several clay-coloured spots and marks. Above these are four round spots, running obliquely toward the shoulders. Several other black marks are dispersed on different parts of the wings, particularly near the anterior edges. Posterior wings deep clay-coloured, with two black waved or indented lines, running along the external margin. Over these

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are four small, round, black spots, placed two and two. Above these, nearer the shoulders, are several small, black, oblong spots, placed irregularly. The wings, particularly the posterior pair, are a little dentated.

Under Side. Anterior wings, at the base and along the posterior edges, clay-coloured. Near the interior angle of each wing is a round black spot; several others which are very small, oblong, and fainter, being scattered about on different parts. Posterior wings, at the base, fainter clay-coloured. About half the wings, from the external edges, are of a blueish clay colour, which is separated from the other part by a faint waved line of a reddish hue. Two other faint waved lines also run along the external edges, answering to the black ones on the upper side; and the four black spots seen there are very small on this side, being but just perceptible.

MELITÆA PHAETON.

Plate XXI. fig. 3. 4.

ORDER: Lepidoptera. SECTION: Diurna. FAMILY: Nymphalidæ, *Sw.*

GENUS. MELITÆA, *Fabr.* Argynnis, *Latr. et God.* Papilio (Dan. Festiv.), *Drury.*

MELITÆA PHAETON. Alis subrotundatis integerrimis, nigris, singularum extimo suprà, paginâ omni subtùs fulvo flavoque maculatis. (Expans. Alar. 3 unc. 9 lin. fere.)

SYN. Papilio (Dan. Festiv.) Phaeton, *Drury, App. v.* 2. *Fabr. Ent. Syst.* III. I. *p.* 46. *No.* 140. *Cramer, pl.* 193. *f.* C. D. Argynnis Phaetontea, *Latr. et God. Enc. Méth.* ix. *p.* 288. *Boisduv. Hist. nat. Lep. pl.* 7. *B. f.* 3.

HABITAT: New York; taken in June and September, whence there are probably two broods in the year.

Upper Side. Body and wings black. The anterior pair of the latter with nine red spots placed near the external edges; above which are two rows of spots, of a lemon colour, with some other small ones placed near the upper edges. Posterior wings with eight red triangular spots, placed close to the external edges. Above these is a row of lemon-coloured crescents; and above that is another row of lemon-coloured round spots. The wings are entire.

Under Side. Anterior wings black, with a red indented margin; within the external edge is a row of lemon-coloured crescents. Near the costa, about the middle of each wing, are two larger red spots, and a smaller one at the corner, next the shoulders. The remainder of the wings is sprinkled with lemon-coloured spots, of different shapes and sizes, in all about twenty-six on each. Posterior wings black, having their external edges margined with triangular red spots; above which is a row of lemon-coloured crescents; and over these is a row of round lemon-coloured spots. The remaining part of the wings is covered with lemon-coloured and red spots; the former very small, and the latter rather large, and angularly shaped.

MELITÆA THAROS.

Plate XXI. fig. 5. 6.

ORDER: Lepidoptera. SECTION: Diurna. FAMILY: Nymphalidæ, *Sw.*

GENUS. MELITÆA, *Fabr.* Argynnis, *Latr. et God.* Papilio (Dan. Festiv.) *Drury.*

MELITÆA THAROS. Alis subrotundatis integerrimis, supra fulvis, lineis plurimis transversis limboque communi nigris, posticis utrinque ad extimum strigâ punctorum nigrorum. (Expans. Alar. 1 unc. 6 lin. fere.)

SYN. Papilio (Dan. Festiv.) Tharos, *Drury, App. v.* 2. *Cramer, pl.* 169. *fig.* E. F.
Argynnis Tharossa, *Latr. et God. Encycl. Méth.* ix. *p.* 289. *No.* 61.

HABITAT: New York.

Upper Side. Head, body, and abdomen dark brown. Anterior wings varied with dark brown and orange; in some the dark brown occupying the greater part of the wings, in others the orange colour is predominant; but the tips and external edges in all are dark brown; in some two ocelli are seen close to the anterior edge, and near the lower corner; but in others these ocelli are not to be discovered. Posterior wings dark brown and orange. Round the edge is a waved dark border, through which a small waved white line, runs from the anal angle about half way; above this are placed, in a row, five round ocelli, and one oblong, next the anal angle; the pupils being black, and the irides orange colour. Above these is a broad orange-coloured band, and next the body the wings are dark brown. All the wings are entire.

Under Side. Anterior wings, at the base, deep clay-coloured, with some dark brown clouds on the anterior edges and interior angles; but in some these clouds are hardly perceptible. In some a small scolloped line runs along the external edges, from the tips to the lower corners, of a reddish hue; in others this is not to be seen, having a dark brown border in that part. Posterior wings very pale clay-coloured, with a cloud on the middle of the external edges, of a reddish brown; where (in some) is a silver spot like a half moon. The black pupils of the six ocelli, seen on the upper side, are, in some specimens, very small here, and just perceptible; in others they are not to be seen. "In short, nature forms such a variety of this species, that it is difficult to set bounds, or to know all that belongs to it."—*Drury.*

PAPILIO THOAS.

Plate XXII. fig. 1. 2.

ORDER: Lepidoptera. SECTION: Diurna. FAMILY: Papilionidæ, *Leach.*

GENUS. PAPILIO, *Auct.*

PAPILIO THOAS. Alis suprà nigris, fasciâ communi lunulisque submarginalibus flavis, posticis caudatis, his subtus maculâ discoidali ferrugineâ lunulisque cœruleis. (Expans. Alar. 4 unc. 9 lin.)

SYN. Papilio (Equ. Ach.) Thoas, *Linn. Mant. p.* 536. *Fabr. Ent. Syst.* III. 1. *p.* 32. *No.* 94. *Cramer, pl.* 167. *fig.* A, B. *Latr. et God. Enc. Méth.* IX. *p.* 62. 103. *Boisduval et Leconte Icon. Lep. Amer. Sept. pl.* 12. *et* 13. *Boisd. H. n. Lep.* 1. *p.* 355.
Var. Pap. Cresphontes, *Cramer*, 165, 166, A.

HABITAT: Surinam (*Drury*). Paraguay to Georgia (*Boisd.*).

Upper Side. Thorax black. Two small yellow streaks extend from the eyes to the shoulders. Abdomen yellow, with a black dorsal line; apex red brown. Wings black, with deep yellow spots on them. A yellow bar, near half an inch broad, begins at the middle of the superior wings, and running parallel with the anterior edges, crosses the inferior ones just below the shoulders. Several oval and oblong yellow spots are placed between the tips and this bar. One also is situated close above it, near the middle of the wing; being separated from it by the tendon, which is black. Below the bar are four small spots, beginning at the interior angle (the first being double). Posterior wings furnished with two black tails, having a long yellow stripe in the middle. About a quarter of an inch above the external edge is a row of six yellow spots, whereof one is obscured by the anterior wing; there being but five shewn in the plate.

Under Side. The breast is ash colour. Anterior wings partly soot colour, but principally yellow. A row of eight yellow spots is situated within the external margin, and the yellow bar, observable on the upper side, is not to be distinguished on this. Several small yellow lines rise at the shoulders, and expanding like the sticks of a fan, occupy almost the chief membrane of the wing.

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Between these, and the row of eight spots, are two large yellow patches, which nearly take up that middle space, with black tendons crossing them like fine threads. Posterior wings, next the shoulders, yellow, continuing to about the middle of the wings. External margin soot-coloured; having a broad bar of yellow above it, whose upper side resembles a row of arches. Above this is an irregular black bar, running from the anterior edges, across the wings, with two small scarlet streaks at the anal angles. On this bar is a row of blue crescents, answering to and placed just above the arch-like bar before-mentioned; and in the centre is a faint mark of scarlet.

The caterpillar of this butterfly feeds upon the orange-trees, from Paraguay to Georgia. Its back is covered with large irregular white spots, with brown marks, which extend along the middle and posterior parts of the body. The chrysalis is of a bright brown, with several black dots.

PAPILIO SINON.

Plate XXII. fig. 3. 4.

ORDER: Lepidoptera. SECTION: Diurna. FAMILY: Papilionidæ, *Leach.*

GENUS. PAPILIO, *Auct.*

PAPILIO SINON. Alis nigris, fasciis communibus virescenti-albis, posticis lunulis sex submarginalibus virescenti-albis anguloque ani rubro. (Expans. Alar. 3 unc. fere.)

SYN. Papilio Sinon, *Fabr. Syst. Ent. p.* 452. *Ent. Syst.* III. 1. *p.* 26. 75. *Cramer, tab.* 317. *fig.* C. D. E. F. *Ency. Méth.* ix. p. 53. *Boisduv. Hist. Nat. Lep.* 1. *p.* 260.
Papilio (Eq. Achiv.) Protesilaus, *Drury, App. vol.* 2.

HABITAT: Jamaica (*Drury*). Florida, Cuba (*Boisduv.*). North America (*Ency. Méth.*).

Upper Side. The thorax black; the hair thereof greenish. Abdomen black. All the wings black; posterior ones being furnished with two tails, edged with white. Close to the shoulders, in the anterior wings, rises a stripe of sea-green, which crosses the inferior ones; and, running parallel with the abdominal margin, ends near the extremity of the body. A little below this is a small scarlet spot, placed near the anal angle; with two smaller spots, of a green colour, below it. At a little distance from the shoulders, a second green stripe, rather broader than the first, begins at the posterior edge of the anterior wings, and crosses the inferior ones, parallel with the first, being continued a little lower. On the anterior wings, about the middle of the anterior edge, rises a bar, of a fine sea-green colour, which crossing both wings, terminates at the middle of the posterior, being narrowest at each end. A row of eight white spots runs parallel with the external edge, ending at the lower corner. Near the external edges of the posterior wings is placed a row of five crescents, of a green colour.

Under Side. Breast and abdomen grey-coloured. Anterior wings light chesnut, having a darker cloud near the anterior angle. All the green spots and marks, seen on the upper side, are also visible here. The ground of the posterior wings is rather paler than the anterior; and the green marks and stripes are rather larger here, than on the upper side. The scarlet spot, on the abdominal edge, is considerably larger on this side. A scarlet stripe also begins on the anterior edge, and fills completely the space between the broad green bar and the second stripe, mentioned above, extending as low as the extremity of the body. The two scollops, next the abdominal corner, are black; whereon appear a few blue powder-like specks.

M. Boisduval states that Drury's figure is "peu exacte." It is true, indeed, that the figure does not agree with the description given by that author, who describes the fourth pale fascia as "bifide dans la cellule discoidale des premières ailes." The exact uniformity in the shape of this fascia, in both of Drury's figures, renders its correctness evident, and consequently the insect figured by Drury must be regarded as a variety of the species described by Boisduval.

NOCTUA MELICERTA.

Plate XXIII. fig. 1.

ORDER: Lepidoptera. SECTION: Nocturna. FAMILY: Noctuidæ.

GENUS. NOCTUA, *Auct.*

NOCTUA MELICERTA. Alis anticis variegatis, posticis nigris, fasciâ maculisque tribus marginalibus albis. (Expans. Alar. 2 unc. 6 lin.)

SYN. Phalæna (Noctua) Melicerta, *Drury, Append. v.* 2. *Cramer, tab.* 62. *fig.* C. D.?
Noctua mercatoria, *Fab. Ent. Syst.* III. 2. *p.* 62. *No.* 175.? *Gmelin, Linn., S. N.* 2544. 1039.
Noctua tigrina, *Fabr., Ent. Syst.* III. 2. *p.* 40. *No.* 105. *Oliv. Enc. Méth.* 8. 277. 131.
Noctua vulpina, *Fabr. Ent. Syst.* III. 2. *p.* 39. *No.* 102.
Phalæna Melicene, *Cram. tab.* 323. *fig.* C. D.

HABITAT: India, Bombay (*Drury*).

Upper Side. Antennæ filiform. Tongue small and spiral. Thorax and abdomen light brown. Anterior wings light greyish brown, and, when held in some particular directions, having a hue like mother-of-pearl. Several irregular bars, of a deeper brown, cross the wings, and the external margin is bordered with pale purple or pearl colour. Posterior wings dark liver-coloured, grey-brown at the base, and hairy. In the middle is a broad bar, of purplish white, running across the wing. On the external edge are three white square spots. The anterior wings are a little dentated; the inferior ones entire.

Under Side. Palpi remarkably long and pointed. Anterior wings dark brown; the external edge being purplish grey, with a whitish separated bar, running from the middle of the anterior edge to the interior angle. Posterior wings light greyish brown, palest at the base, and grey at the external edge, having a dark spot at the anal angle, and a smaller faint one near the shoulders; with several indented lines crossing the wings in different places.

Fabricius appears to have described this insect in his Entomologia Systematica, under three different names. It probably forms the type of a distinct subgenus in the family Noctuidæ.

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CATOCALA EPIONE.

Plate XXIII. fig. 2.

ORDER: Lepidoptera. SECTION: Nocturna. FAMILY: Noctuidæ, *Steph.*

GENUS. CATOCALA, *Schrank.* Blephara, *Hübn.* Phalæna (Noctua), *Linn.*

CATOCALA EPIONE. Alis anticis fuscis, strigis transversis dentatis ferrugineis et atris, posticis nigris, ciliâ albâ. (Expans. Alar. 2 unc. 6 lin.)

SYN. Phalæna (Noctua) Epione, *Drury, App. vol.* 2. *Oliv. Encycl. Méthod.* 8. 288. *No.* 190.

HABITAT: New York (*Drury*). Philadelphia (*I. O. W.*).

Upper Side. Thorax and abdomen of a sooty ash colour. Anterior wings dark chocolate, with an undulated ferruginous line, running from the anterior edge to the posterior, and near the middle of the wings; with several other lighter not very distinct marks thereon. Posterior wings black; cilia white.

Under Side. Anterior wings, at the base, dark ash colour, which as it extends further on the wings, becomes black; and next the tips is soot-coloured. Seven white spots run along the external margin. Above them is a white line, running from the anterior edge, narrowing as it goes, and ending near the posterior; between which and the shoulders is a rather large oblong white spot. Posterior wings, next the shoulders and abdominal edges, very dark ash colour, which deepens along the wings to black; cilia white. A faint white streak runs also a little way down the wing from the anterior margin. All the wings are a little dentated.

NOCTUA PALES.

Plate XXIII. fig. 3.

ORDER: Lepidoptera. SECTION: Nocturna. FAMILY: Noctuidæ.

GENUS. NOCTUA, *Auct.*

NOCTUA PALES. Alis luteis, anticis strigâ transversâ punctoque apicali fuscis. (Expans. Alar. 1 unc. 9 lin.)

SYN. Phalæna (Noctua) Pales, *Drury, App. vol.* 2.

HABITAT: St. Christopher's.

Upper Side. Antennæ filiform. Tongue spiral. Head small. Thorax, abdomen, and wings light orange clay-coloured, without any markings, except on the anterior wings, where a faintish bar crosses the middle; and, near the tips of the wings, is a small dark spot. The wings are entire.

Under Side. The same colour as the upper, immaculate.

CALLIMORPHA? VINOSA.

Plate XXIII. fig. 4.

ORDER: Lepidoptera. SECTION: Nocturna. FAMILY: Arctiidæ.

GENUS. CALLIMORPHA? *Latr.* Sphinx p. *Drury.*

CALLIMORPHA? VINOSA. Alis nigris subdiaphanis, anticarum marginibus anticis et posticis rufo fulvis maculâ magnâ externâ (in medio albâ margine nigro); posticis fasciâ submarginali rufo-fulvâ. (Expans. Alar. 2 unc. fere.)

SYN. Sphinx Vinosa, *Drury, App. vol.* 2.

HABITAT: Antigua.

Upper Side. The antennæ are black, small, and pectinated. The tongue not discoverable. Thorax and base of abdomen yellow orange; the remainder of the abdomen rusty grey, with a black stripe down the top of it. Anterior wings black and transparent, like gauze; the anterior and posterior margins bordered with orange. The tips of the wings are likewise broadly orange, through the middle of which runs a broad bar of white, from the anterior to the middle of the external edge, where it is narrowest, being edged with black. Posterior wings black, and like gauze; the external edge having a narrow orange stripe running from the anal margin, half way to the exterior angle. The wings are entire.

Under Side. The abdomen is grey, with a black line running from the thorax to the tail. Anterior wings not edged with orange; the tips are black, where the white bar is plainly seen, having an orange spot on the edge, near the external and lower corners. Posterior wings as on the upper side.

This insect seems to form the type of a distinct subgenus between Nudaria and Callimorpha.

NOCTUA NUMERIA.

Plate XXIII. fig. 5.

ORDER: Lepidoptera. SECTION: Diurna. FAMILY: Noctuidæ.

GENUS. NOCTUA, *Auct.*

NOCTUA NUMERIA. Alis fuscis, anticis vittâ longitudinali albâ, anticè strigis undulatis transversis; posticis maculâ externâ albâ. (Expans. Alar. 2 unc. 3 lin.)

SYN. Phalæna (Noctua) Numeria, *Drury, App. vol.* 2.

HABITAT: Jamaica.

Upper Side. Antennæ filiform. Tongue spiral. Head, thorax, and abdomen fine brown. Anterior wings fine brown, through the middle of which runs a small longitudinal bar of white or pearl, beginning just below the shoulders, and losing itself just below the tips. Above this bar the wings are watered with various marks of dark and light brown. Behind it they are of a darker shade, except a spot near the middle of a yellowish brown. Posterior wings dark brown, with two white marks on the edges, about a third of an inch long; beginning on the anterior edge, and crossing the corner to the external edge.

Under Side. Breast, legs, abdomen, and wings greyish brown or russet, with some faint, dark indented lines running across all the wings in different parts. The white marks on the edges of the posterior wings are very visible on this side. The wings are entire.

CATOCALA AFFINIS.

Plate XXIII. fig. 6.

ORDER: Lepidoptera. SECTION: Nocturna. FAMILY: Noctuidæ.

GENUS. CATOCALA, *Schr.* Blephara, *Hübn.* Phalæna (Noctua), *Linn.*

CATOCALA AFFINIS. Alis anticis fuscis maculis ordinariis discoidalibus strigisque dentatis obscurioribus; posticis fulvis fasciâ centrali margineque postico latè nigris. (Expans. Alar. 2 unc.)

SYN. Phalæna (Noctua) Paranympha, *Drury, App. vol.* 2. (excl. syn. Linnæan.)

HABITAT: New York; taken on the 27th day of July.

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SMITHSONIAN TESTIMONIAL

Upper Side. The thorax and anterior wings dark chocolate, with a small, narrow, irregular black line crossing the wings, near the external edge; having near it, just above the fringe, a row of seven small grey spots. Posterior wings pale orange; having a deep black border. A rather broad black line runs in a circular direction from the anterior edge, through the middle of the wings, to the lower part of the interior margin. At the outer angle is a small spot of a pale orange.

Under Side. Anterior wings at the base of a dark clay colour, with a large yellowish cloud occupying all the middle part; in which is a large black streak running across the wing. Posterior wings marked as on the upper side, but all the colours fainter.

ACTIAS LUNA.

Plate XXIV. fig. 1.

ORDER: Lepidoptera. SECTION: Nocturna. FAMILY: Bombycidæ.

GENUS. ACTIAS *Leach.* Saturnia, *Schrank.* Attacus, *Germar.* Phalæna (Attacus), *Linn.*

ACTIAS LUNA. Alis caudatis flavo-virentibus concoloribus, ocello disci lunato, margine antico anticarum purpureo. (Expans. Alar. 5 unc. 6 lin.)

SYN. Phalæna (Attacus) Luna, *Linn. Syst. Nat.* 2. 810. *No.* 5. *Catesby Carolina, 2nd vol. p.* 85. *Fabr. Ent. Syst.* III. 1. *p.* 414. *No.* 22. *Gmel. Linn. S. N.* 2404. 5. *Abbot & Smith Ins. Georgia, pl.* 48. *Oliv. Enc. Méth.* 5. 29. 20. *Pal. Bauv. Ins. Afr. & Am. Lep. pl.* 22. *f.* 3. *Leach Zool. Misc. v.* 2. (Actias L.)

HABITAT: New York, Carolina, Virginia, Maryland.

Upper Side. Antennæ brown, and strongly pectinated. The head white, small, and almost hid under the shoulders and neck, having a small brown ring encircling it. Thorax pale yellow, having a chocolate or dark brown line crossing it, parallel with the margins of the anterior wings. All the wings are of a beautiful pea-green colour; the nerves being of a pale red brown. Along the anterior margin of the anterior wings runs a chocolate line, which is narrowed towards the tips. About an inch from the shoulders springs from this line a small curved one, which, bending towards the middle of the wing, terminates in a small eye, pointed in the lower part, whose pupil is transparent like glass; the iris being partly red and partly black, within which are semicircles of white; external margin of the wings, red brown; the posterior being white. Posterior wings furnished with two broad tails, which, at their extremities, appear as if they were crimped; their external edges being red brown. In the middle of each of these wings is likewise an eye, similar to, but rather larger than those in the anterior ones. Abdomen white.

Under Side. Abdomen white, the sides being of a dark clay colour. All the wings are of the same colour as on the upper side; the nerves being browner and more conspicuous, without the brown edge on the anterior pair; the eyes themselves are the same as on that side. The anterior margin of the inferior wings is white, and the eyes strongly resemble those of an animal having them half shut.

Drury's correspondent informed him that the caterpillar of this handsome moth is red, and feeds on the leaves of the sassafras tree. When they are full-fed they inclose themselves in a strong case composed of the substance of the tree, and a glutinous matter which they secrete. They appear in June and August. The caterpillar, however, figured by Abbot is green, with short hairs scattered over the body, and with about eight small red

spots on each segment, placed transversely. This author also states that it feeds upon the sweet gum (Liquidambar styraciflua, Linn.), different kinds of walnut, and the Persimon (Diospyros Virginiana). One of them spun up on the 31st of May, and came out on the 8th of June; another on the 23rd of June, and came out on the 10th of July; and a third, which did not spin up until the 6th of September, remained in the chrysalis till the 3rd of March. It continues breeding throughout the summer, but is not very plentiful.

DEIOPEIA ORNATRIX.

Plate XXIV. fig. 2.

ORDER: Lepidoptera. SECTION: Nocturna. FAMILY: Lithosiidæ.

GENUS. DEIOPEIA, *Stephens.* Euchelia, *Boisduval.* Eyprepia p. *Ochs.*

DEIOPEIA ORNATRIX. Alis convolutis albidis, anticarum margine rubro atropunctato, posticis albo nigroque variis. (Expans. Alar. 1 unc. 9 lin.)

SYN. Phalæna (Noctua) ornatrix, *Linn. S. N.* 2. 839. *No.* 110.
Bombyx ornatrix, *Fab. Ent. Syst.* 111. 1. *p.* 480. *No.* 225. *Gmel. Linn. S. N.* 2444. 110. *Oliv. Enc. Méth.* 5. 100. *No.* 258.

HABITAT: Antigua *(Drury).* America *(Linn. Fabr.).*

Upper Side. Antennæ black, filiform. Head with a black frontal spot; tongue spiral. Thorax flesh-coloured, with small black spots. Anterior wings fine flesh-coloured; the anterior edges being bordered with scarlet, except four small white places, in each of which is a small black spot; near the base is a red cordate spot, with a small black one above it; near the external margin is a row of small black spots; above this is a row of red ones, nearly joining together, and nearly united to the red border at the anterior edge, and above this is another row of black ones. Posterior wings clear white, their external edges with large angular spots of black, one of them running to the anterior edge.

Under Side. Anterior wings fine deep scarlet, but next the shoulders white, as is the cilia, where joining to it, is a row of very small black spots; a little above this is a black irregular line, running from the anterior edge to the lower angle; above this line is another, shorter, reaching half way across the wings. Posterior wings clear white, spotted with the same black angular spots, as on the upper side; the anterior edges being of the same scarlet colour as the superior wings.

DEIOPEIA BELLA.

Plate XXIV. fig. 3.

ORDER: Lepidoptera. SECTION: Nocturna. FAMILY: Lithosiidæ.

GENUS. DEIOPEIA, *Stephens.* Euchelia. *Boisduval.* Eyprepia p. *Ochs.*

DEIOPEIA BELLA. Alis anticis albidis, fasciis sex punctorum nigrorum fasciis fulvis divisis; posticis rubris apice nigris. (Expans. Alar. 1 unc. 9 lin.)

SYN. Phalæna (Tinea) bella, *Linn. S. N.* 2. 884. *No.* 348. *Fabr. Ent. Syst.* 111. 1. 479. *No.* 223. *Gmel. Linn. S. N.* 2447. 348. *Oliv. Enc. Méth.* 5. 99. 256.

HABITAT: New York.

A. COLMSON TESTIMONIAL

Upper Side. Antennæ black and filiform. Head with a small black spot between the antennæ. Thorax and abdomen white; on the former are several small black spots. Anterior wings of a fine yellow, with several white, narrow, irregular bars crossing them; having on each several small black spots; cilia white, and above it is a row of small black spots that almost joins it. Posterior wings faint scarlet, externally edged with a narrow black border; cilia white.

Under Side. The anterior wings fine scarlet, inclining along the anterior edge to yellow; where are several angular black spots, each lengthening as it approaches the tips; along the external margin is a row of small black spots. Posterior wings scarlet, edged with the same black border as on the upper side; on the anterior edge are two white spots, with black ones in their centres.

In the 'Systema Naturæ' this and the preceding most nearly allied species were placed far apart in the genera Noctua and Tinea. This species appears in May and August. The caterpillar is of the same colours as the anterior wing of the moth, and feeds on the blue lupine.

SPHINX CAROLINA.

Plate XXV. fig. 1.

ORDER: Lepidoptera. SECTION: Crepuscularia. FAMILY: Sphingidæ, *Leach.*

GENUS. SPHINX, *Auct.*

SPHINX CAROLINA. Alis anticis fusco cinereoque variis, posticis fasciis 3-4 fuscis exterioribus dentatis; ciliâ albo nigroque variâ, abdomine maculis 10-12 lateralibus luteis. (Expans. Alar. 5 unc.)

SYN. Sphinx Carolina, *Linn. S. N.* 2. 798. *No.* 7. *Brown. Jam.* 438. *t.* 43. *f.* 17. *Fabr. Ent. Syst.* III. 1. *p.* 363. *No.* 25. *Gmel. Linn. S. N.* 2377. *No.* 7. *Stephens Ill. Brit. Ent. H.* 1. 118. *Abbot & Smith, Ins. Georg. tab.* 33. *Curtis Brit. Ent.* v. *pl.* 1. 197.

HABITAT: New York, Maryland, Virginia.

Upper Side. Antennæ internally white, but externally brown. The head, thorax, and abdomen of a rusty grey brown; the sides of the latter having five oblong yellow spots, intersected by black lines, on each of which is a small white spot placed between the yellow ones. Anterior wings rusty grey brown, with a white spot at the base, and another small discoidal white one; a narrow irregular indented line of white begins near the interior angle, and runs nearly to the tip; several indented lines, nearly black, cross the wings, more or less distinct. Cilia brown, spotted with white. Posterior wings brown, darkest in the middle, the shoulders being nearly black, with an indented narrow bar of ash colour running across them, from the middle of the anterior edges to the anal angle; below this is a narrow black one, answering and joining to it.

Under Side. Breast and abdomen ash-coloured. Anterior wings brown, without any marks or shades, except two very faint undulated dark lines crossing them. Posterior wings, next the body, ash-coloured; the remainder being like the anterior, with some faint dark lines crossing them.

According to Abbot the caterpillar is pale green, with white lateral oblique stripes, and a pink tail. It is said to feed on the potato, tobacco, red pepper (Capsicum?), &c. One of these caterpillars, observed by Abbot, went into the ground on the 19th of June, and came out on the 15th of July; whilst another went in on the 8th of July, and came out

on the 1st of August. The caterpillar is stated by the same author to be very destructive in plantations of tobacco, the cultivators being obliged to pick them carefully off the young plants. The chrysalis is of a chesnut colour, with a long nearly straight tongue case, extending to the middle of the breast, and clubbed at the end. The moth is generally seen in an evening, sucking the James-town weed and gourd blossoms, and continues breeding all the summer; the moth is common in the West Indies, as well as in Georgia and Carolina. Dr. Brown says it is called the musquito hawk, from its appearing at that time of the evening when those insects abound, and being vulgarly but erroneously supposed to prey upon them. *Abbot and Smith, loc. cit.*

Specimens of this American insect have from time to time been captured in this country. "It unquestionably cannot," however observes Mr. Stephens, "be considered as indigenous, and ought to be rigidly excluded from our cabinets; otherwise the most perplexing consequences must inevitably arise, to the total confusion of our inquiries into the geographical distribution of insects. If this be admitted, as well might 'the noble monarch of the forest,' because a captive lioness which had escaped from her prison was retaken on Salisbury Plain."

SYNTOMIS PHEGEA.

Plate XXV. fig. 2.

ORDER: Lepidoptera. SECTION: Crepuscularia.? FAMILY: Zygænidæ, *Leach.*

GENUS. SYNTOMIS, *Illiger.* ZYGÆNA, *Rossi. Fabr.* Sphinx, *Linn.*

SYNTOMIS PHEGEA. Viridi-atra alarum punctis fenestratis, anticarum sex, posticarum duobus; abdomine cingulo luteo. (Expans. Alar. 1 unc. 9 lin.)

SYN. Sphinx Phegea, *Linn. Syst. Nat.* 2. 805. 35. *God. Lepid. du Franc. pl.* 22. *f.* 14.
Zygæna Quercûs, *Fabr. Ent. Syst.* III. 1. 388. No. 6.
Syntomis Quercûs, *Latr. Genera Crust. et Ins.* 4. *p.* 213.
Sphinx du Pissenlit, *Engram Pap. d'Eur.*

HABITAT: Germany.

Upper Side. Antennæ black, filiform, with the tips white. Head and thorax black. Abdomen dark green, almost black; on the top, next the thorax, is a deep yellow spot like gold, and near the extremity a ring of the same golden yellow extends just below the sides. Anterior wings dark green; having six transparent spots, one next the shoulders, two in the middle, and three next the tips. Posterior wings of the same colour as the superior, with two transparent spots on them.

Under Side. Breast and abdomen dark green; on each side the breast are two golden yellow spots. All the wings are coloured and marked as on the upper side.

GLAUCOPIS FENESTRATA.

Plate XXV. fig. 3.

ORDER: Lepidoptera. SECTION: Crepuscularia? FAMILY: Zygœnidæ, *Leach.*

GENUS. GLAUCOPIS, *Fabr.* Charidea, *Dalm.* Sphinx, *Linn.*

GLAUCOPIS FENESTRATA. Alis anticis nigris, maculâ magnâ discoidali fere ocellatâ fenestratâ, posticis fenestratis margine nigro, pedibus palpisque coccineis. (Expans. Alar. 2 unc. 6 lin.)

SYN. Sphinx Fenestrata, *Drury, App. v.* 2.

HABITAT: Jamaica.

Upper Side. Antennæ nearly black, and pectinated. Head and eyes black. Palpi small and long, and of a fine scarlet. Tongue spiral. Thorax blueish green, almost black. Abdomen dark brown. Anterior wings the same, the middle part being perfectly transparent like glass, wherein is a dark cloud which is joined to the anterior margin. Posterior wings small, transparent, with a dark brown narrow border running round their edges, which at the upper corners is broad where it becomes cloud-like.

Under Side. Breast dark brown. Legs and thighs scarlet, which colour extends along the middle of the abdomen, almost to the tail, where it becomes a little fainter, being crossed by the rings of the abdomen, which are black and very narrow. All the wings of the same colour as on the upper side.

SPHINX CINGULATA.

Plate XXV. fig. 4.

ORDER: Lepidoptera. SECTION: Crepuscularia. FAMILY: Sphingidæ, *Leach.*

GENUS. SPHINX, *Auct.*

SPHINX CINGULATA. Alis anticis cinereo atroque undatis, puncto parvo discoidali; posticis nigro fasciatis, basi sanguineis, abdominis fasciis alternis interruptis sanguineis et atris. (Expans. Alar. 4 unc. 6 lin.)

SYN. Sphinx Cingulata, *Fabr. Ent. Syst.* III. 1. 395. *No.* 56.
Sphinx Convolvuli var. *Drury, Append. vol.* 2. (Exclus. *Syn. Gmel. Linn. S. N.* 2376. *No.* 6.) *Abbot and Smith Ins. Georg.* 1. *tab.* 32.

HABITAT: St. Christopher's.

Upper Side. Antennæ white on one side, and brown on the other. Thorax dark brown, with several curved lines running across it from one shoulder to the other. The abdomen, on the upper part is beautifully encircled with five rings of rose colour, and six of black, extending to its sides, having on the top of it a line of a rusty brown, which runs from the base to the extremity. Anterior wings brown chesnut, marked with lighter and darker clouds, some of which are almost black; having a lighter spot near the middle, and not far from the anterior margin. Posterior wings at the base black, but along the external edges of a grey brown, the middle being occupied by three bars of red, ash, and faint rose colours, separated by three black waved lines crossing them from the anterior to the interior. Cilia brown spotted with white.

Under Side. Breast and abdomen ash-coloured; along the latter are five dark spots (the middle ones the largest) placed at the bottom of the five segments near the breast. Anterior wings dark hazel, immaculate. Posterior wings of the same colour along the anterior and external margins; but next the shoulders and inner edges are of a grey ash colour; a dark coloured line begins near the anal angle,

where it is almost black, and runs across the wing, ending at the middle of the anterior edge; from whence to the middle it resembles a row of arches joined together.

The caterpillar of this insect, according to Abbot and Smith, is brown, with four dorsal dark flesh-coloured lines, and a series of short lateral oblique cream-coloured marks united together over the legs. It feeds upon the sweet potatoe plant (Convolvulus Batatas, Linn.), and is sometimes frequent though the moth is rare. The chrysalis is chesnut, with a long curved tongue case, the extremity of which is recurved. It is often dug up with the potatoes. In Virginia one of these insects buried itself October 3rd, and came forth in the perfect state on the 30th of May; whilst one observed in Georgia went into the ground on the 20th of August, and came out the 11th of September.

This species was considered by Drury and Smith as a climatal variety of the Europæan Sphinx Convolvuli. Fabricius, however, considered it distinct, and designated it by the specific name adopted above.

GLAUCOPIS POLYMENA.

Plate XXI. fig. 1.

ORDER: Lepidoptera. SECTION: Crepuscularia? FAMILY: Zygænidæ, *Leach.*

GENUS. GLAUCOPIS, *Fabr.* Sphinx, *Linn. Drury.*

GLAUCOPIS POLYMENA. Nigra, alis maculis luteis, anticis tribus, posticis duabus; abdomine cingulis coccineis. (Expans. Alar. fere 2 unc.)

SYN. Sphinx Polymena, *Linn. Syst. Nat.* 2. 806. *No.* 40. *Cram. Ins. t.* 13. *f.* D.
Zygæna Polymena, *Fabr. Ent. Syst.* 111. 1. *p.* 396. *No.* 34. *Gmel. Linn. S. N.* 2394. 40. (Sphinx.)

HABITAT: China.

Upper Side. Antennæ black and pectinated, being smallest at their extremities; between them is a white round spot placed on the front of the head; above them, on the neck, is a round spot of bright scarlet. Thorax black. The first segment of the abdomen scarlet; the two next are black, verged on their lower edges with a beautiful sky blue colour; behind this the abdomen is of a fine vermilion, separated by two small black lines, the extremity being black. Anterior wings dark brown, having next the shoulders a small spot of shining blue, and three spots of a deep yellow; the two largest of which appear as if divided by the tendons, which are black and run across them. Posterior wings dark brown, with two deep yellow spots; the smaller one near the shoulders, the other near the middle.

Under Side. Breast black, spotted with white at the base. The abdomen dark brown at the base, behind which is pale red tinged with white; the extremity dark brown. Anus pale red. The wings are the same colour as on the upper side.

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SYNTOMIS CERBERA.

Plate XXVI. fig. 2.

ORDER: Lepidoptera. SECTION: Crepuscularia? FAMILY: Zygænidæ, *Leach.*

GENUS. SYNTOMIS, *Fabr.* Sphinx, *Linn. Drury.*

SYNTOMIS CERBERA Viridi-atra, alis anticis punctis sex fenestratis, posticis duobus, abdomine cingulis duobus sanguineis (postico latissimo).

SYN. Sphinx Cerbera, *Linn. Syst. Nat.* 2. 806. 38. *Cramer, tab.* 83. *fig.* F.
Zygæna Cerbera, *Fabr. Ent. Syst.* III. 1. *p.* 391. *No.* 16.
Sphinx Cerbera, *Gmel. Linn. S. N.* 2398. 38.
Syntomis Cerbera, *Boisduv. Monogr. Zygæn. pl.* 7. *f.* 6.

HABITAT: Cape of Good Hope.

Upper Side. Antennæ and head black. Thorax and abdomen shining blueish green; the latter having on the middle three rings of scarlet extending from side to side, but not meeting underneath. Anterior wings dark green, with six transparent spots like glass on them; the smallest, near the base, is round; three others, placed next the external margin, are oblong; the other two, which are in the middle, are oval and triangular. Posterior wings dark green, with two transparent spots; the largest next the shoulders; the other, which is round and small, beyond the middle.

Under Side. Breast, abdomen, and legs shining mazarine blue, inclining to green; on the former is a small red spot, close to the shoulders of the superior wings. The hinder legs have one joint white. Wings of the same colour as on the upper side.

DEILEPHILA CHIRON.

Plate XXVI. fig. 3.

ORDER: Lepidoptera. SECTION: Crepuscularia. FAMILY: Sphingidæ, *Leach.*

GENUS. DEILEPHILA, *Ochsenheimer.* Spectrum p. *Scop.* Sphinx p. *Linn.*

DEILEPHILA CHIRON. Alis anticis castaneis, fasciâ obliquâ pallidâ utrinque fusco marginatâ, posticis nigris maculis quinque albidis. (Expans. Alar. 3 unc. 6 lin.)

SYN. Sphinx Chiron, *Drury, App. vol.* 2.

HABITAT: Jamaica.

Upper Side. Antennæ and head chesnut; a flesh-coloured line encircles the eyes, running to the shoulders, where it becomes white. Thorax chesnut. Abdomen rather paler on the top; underneath very light clay colour. Anterior wings sorrel chesnut, having two faint oblique waved lines crossing them from the tips to the middle of the posterior edges, where is a small cloud the colour of blue clay, and next the shoulders is a small narrow cream-coloured mark. Posterior wings dark brown, with a row of yellow cream-coloured spots running from the anal angle towards the middle of the anterior margin.

Under Side. Breast and abdomen very pale clay colour. Anterior wings at the base pale clay-coloured, towards the middle darker; from thence to the tips prettily clouded with orange and clay-coloured marks, divided by dark lines, and many small dark brown spots. Posterior wings along the interior margin clay-coloured, and along the extreme part of the anterior edges the same; the remainder of the wings dull orange, faintly shaded and spotted with brown marks and dots.

ZYGÆNA? THETIS.

Plate XXVI. fig. 4.

ORDER: Lepidoptera. SECTION: Crepuscularia? FAMILY: Zygænidæ, *Leach.*

GENUS. ZYGÆNA? *Fabr.* Anthrocera, *Scop.* Sphinx, *Drury.*

ZYGÆNA? THETIS. Cœrulea, thorace anticè rubro punctato, alis nigris, anticis apice, posticis disco, hyalinis. (Expans. Alar. 1 unc. 6 lin.)

SYN. Sphinx Thetis, *Linn. Mantiss.* 1. 539.
Zygæna Thetis, *Fabr. Ent. Syst.* 111. 1. 391. *No.* 17. *Gmel. Linn. S. N.* 2393. 115. (Sphinx T.)

HABITAT: Jamaica.

Upper Side. Antennæ black. Head and thorax black. On the neck are two small scarlet spots just above the eyes, and one on each side below them. Abdomen silvery shining blue, having a triangular black mark at the base. Anterior wings dirty black, immaculate; tips whitish. Posterior wings dirty black, with a white discoidal transparent cloud.

Under Side. Breast and sides dirty black. Abdomen white; its sides and tip dirty black. Wings of the same colour as on the upper side.

MACROGLOSSA ZONATA.

Plate XXVI. fig. 5.

ORDER: Lepidoptera. SECTION: Crepuscularia. FAMILY: Sesiidæ, *Steph.*

GENUS. MACROGLOSSA, *Ochs.* Macroglossum, *Scop.* Sphinx, *Fabr. Drury.*

MACROGLOSSA ZONATA. Alis nigricantibus, anticis punctis tribus subapicalibus, abdominisque fasciâ albis. (Expans. Alar. 2 unc. 3 lin.)

SYN. Sphinx Zonata, *Drury, App. vol.* 2.

HABITAT: St. Christopher's.

Upper Side. Antennæ dark brown, hooked at the extremities; the under sides being paler. Thorax and abdomen dark greyish brown; the extremity of the latter broad and hairy, with a white transverse central fascia; between which and the extremity are three small lateral white spots. Anterior wings very dark brown, with three transparent minute spots beyond the middle; above which, near the anterior margin, is a single black one. Posterior wings dark brown, immaculate.

Under Side. The middle of the abdomen at the base ash-coloured, extending about half way, narrowing gradually; the middle of each of the segments being the same. Posterior wings coloured as on the upper side; the posterior, along the interior margin to the shoulders, being ash-coloured.

SPHINX ALOPE.

Plate XXVII. fig. 1.

ORDER: Lepidoptera. SECTION: Crepuscularia. FAMILY: Sphingidæ, *Leach.*

GENUS. SPHINX, *Auct.*

SPHINX ALOPE. Alis dentatis fuscis, strigis dentatis nigris, posticis fulvis apice latè nigris; abdomine nigro cingulis interruptis pallidis. (Expans. Alar. 4 unc. 3 lin.)

SYN. Sphinx Alope, *Drury, App. vol.* 2. *Cramer*, 26. *tab.* 301. *fig.* G. *Fabr. Ent. Syst.* 111. 1. 362. *No.* 20. *Gmel. Linn. S. N.* 2375. 62.

HABITAT: Jamaica.

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Upper Side. Antennæ red brown above, white underneath. Head and thorax dark brown; head and thorax with a black dorsal line. Abdomen encircled with rings of brown and dark ash colour, divided on the top by a dark ash-coloured line running from the thorax to the extremity. Posterior wings dark brown coloured, having some dark irregular lines, almost black, crossing them from the anterior to the posterior margin, and a row of small black angular marks running along their external margin; these wings are a little dentated. Posterior wings yellow, with a deep black border.

Under Side. Abdomen dark ash-coloured. Anterior wings brown, spotted along their external edges with long yellowish spots. Posterior wings brown, with a deep border; the middle of the wings and abdominal edges being yellow; a narrow black indented line begins at the abdominal corners, and crossing the wings ends at the anterior margin below the middle.

Fabricius, on the authority of Dr. Pflug, states that this insect frequents the Carica Papaya. The larva is tailed, without hairs, the back cinereous anteriorly, with a broad fascia of a brown colour, ocellated in the middle and ending in a black spot. The chrysalis is brown, with red annuli and striæ.

SPHINX PINASTRI.

Plate XXVII. fig. 2.

ORDER: Lepidoptera. SECTION: Crepuscularia. FAMILY: Sphingidæ, *Leach.*

GENUS. SPHINX, *Auct.*

SPHINX PINASTRI. Alis cinereis, anticis lineolis tribus confertis nigris; abdomine fusco, cingulis atris suprà albo marginatis et dorso interruptis. (Expans. Alar. 3 unc. 9 lin.)

SYN. Sphinx Pinastri, *Linn. Syst. Nat.* 2. 892. *No.* 22. *Sepp. Ins.* 3. 23. *t.* 5. *Roesel. Ins. Belust.* 1. *Phal.* 1. *t.* 6. *Donov. Engl. Ins.* ix. 10. *pl.* 296. *Fabr. Ent. Syst.* iii. 1. 367. *No.* 35. *Gmel. Linn. S. N.* 2385. 22. *Stephens Illust. Brit. Ent. Haust.* 1. 121.

HABITAT: Germany (*Drury*). England, and other parts of Europe.

Upper Side. Antennæ white on one side, and brown on the other. Head and thorax brown grey; the latter at the base being ash-coloured, having a black line running on each side. Abdomen brown grey, encircled with rings of a dirty black, divided on the top by a broad line of brown grey, through which runs a black line from the base to the extremity. Anterior wings brown grey, with three short black lines in the middle of each wing; at the tips rises another irregular narrow black line, running towards the middle of the wing, and chequered with white and black. Posterior wings brown grey, immaculate, being a little paler towards the shoulders; the wings are entire. Cilia alternately black and white.

Under Side. The breast and abdomen are ash-coloured. All the wings brown grey, immaculate. Cilia spotted as above.

This insect is attached to the pine, and is consequently found in the great forests in Germany, and other parts of Continental Europe. This accounts for its scarcity in England, and for its having been occasionally found in the pine forests of Scotland by Dr. Leach and Mr. Wilson. The larva is described by Mr. Stephens as being entirely yellow in its first skin, in the second green with yellow stripes, in the third deeper green, with three longitudinal lemon-yellow lines on each side, and finally of a rich green with a

brown dorsal line; the sides with two deep yellow ones; the anterior and first segment of the body yellow, the latter spotted with black; the horn, which was previously straight, becomes curved and black. It feeds on various species of pine, as Pinus abies, sylvestris, Strobus, &c. The chrysalis is dark brown, changing to maroon; the tongue-sheath is short.

SPHINX ELLO.

Plate XXVII. fig. 3.

Order: Lepidoptera. Section: Crepuscularia. Family: Sphingidæ, *Leach*.

Genus. Sphinx, *Auct.*

Sphinx Ello. Alis subdentatis cinereis; posticis rufis margine nigro; abdomine pallido cingulis (dorso interruptis) nigris. (Expans. Alar. 3 unc. 6 lin.)

Syn. Sphinx Ello, *Linn. Syst. Nat.* 2. *p.* 809. *No.* 13. *Cramer, tab.* 301. *fig.* D. *Merian Surin. t.* 61. *f.* 2. *Fabr. Ent. Syst.* III. 1. 362. *No.* 21. *Gmel. Linn. S. N.* 2375. 13.

Habitat: St. Christopher's (*Drury*). Surinam (*Mad. Merian*).

Upper Side. Antennæ white on one side, and brown on the other. Head and thorax ash-coloured; the latter having some faint narrow dorsal and lateral black lines. Abdomen ash-coloured, encircled with black rings extending to its sides, divided on the top by an ash-coloured line. Anterior wings dentated and ash-coloured, having an irregular shade of black and dark brown running from the tips to the shoulders, and a few small black spots dispersed on different parts of the wings. Posterior wings red, with a black border. Cilia reddish white.

Under Side. Breast, thighs, legs, and abdomen ash-coloured. Anterior wings, in the middle, ferruginous; but toward the external edges and the tips dirty red brown. Posterior wings next the shoulders and interior margin ash-coloured, but in the middle of a reddish colour; along the anterior margin they are of a brown grey, and along the external margin they are of a dirty red brown. These wings are a little dentated.

SPHINX VITIS.

Plate XXVIII. fig. 1.

Order: Lepidoptera. Section: Crepuscularia. Family: Sphingidæ, *Leach*.

Genus. Sphinx, *Auct.*

Sphinx Vitis. Alis anticis olivaceo-fuscis, fasciâ, vittâ lineisque pallidis; posticis cinereis fasciâ nigrâ margineque roseo. (Expans. Alar. 4 unc.)

Syn. Sphinx Vitis, *Linn. Syst. Nat.* 2. 801. *No.* 16. *Merian Surin. tab.* 47. *f.* 1. *Cram. Ins. tab.* 267. *fig.* C. *Fabr. Ent. Syst.* III. 1. 369. *No.* 41. *Gmel. Linn. S. N.* 2380. 16. *Abbot and Smith, Ins. Georgia*, 1. *t.* 40.

Habitat: Antigua, Jamaica, St. Christopher's (*Drury*). "In vitæ Americes" (*Linn.*). "Magnolia glauca" (*Fabr.*). "Jussiæa erecta" (*Abbot and Smith*).

Upper Side. Head and thorax dark flesh-coloured; on the latter, near the neck, is a long spot of olive brown, with another on each side. Abdomen dark flesh-coloured, having two olive brown streaks above, extending from the base to the extremity, being intersected by narrow flesh-coloured annuli or

PL. XXVIII.

rings. The ground of the anterior wings is a fine olive brown; a flesh-coloured bar begins at the tips, and running parallel with the anterior margin at the middle of the wing, divides into two branches, one continues to the shoulder margin, the other terminates at the middle of the posterior margin; on the upper part of the bar is placed a small flesh-coloured mark, discoidal, the middle being black; near the tips arises also from the upper side a second smaller branch, which runs to the anterior edge, which, with the external margin, has a narrow border of a rusty clay colour. Posterior wings with their external edges bordered with red; above which is a black bar, extending from the anterior edge to the anal angle, where it is much fainter; the inner margin also red, with a large black patch thereon. The upper parts of the wings are of a blueish ash colour. Nerves pale.

Under Side. Breast, thighs, and abdomen dark flesh-coloured. The colours of all the wings on this side are faint, being principally of a clay colour; the inferior ones, next the abdominal edges, being tinged with red.

The caterpillar of this beautiful Sphinx is remarkable for having only a slight protuberance at the extremity of the body in place of the erect spine or tail, which is possessed by the majority of the caterpillars of the Sphingidæ. It is of a pale yellowish colour, with numerous slender transverse black lines, and white oblique lateral marks *directed towards the head.* Its food is very various. One, observed by Abbot, went into the ground on the 14th of August, and came out on the 7th of September; whilst another which went in on the 29th of September, did not come out until the 18th of July following. The moth is rare; but may occasionally be seen sucking the gourd blossoms in the evening. The chrysalis has a pointed tail, but is destitute of a porrected tongue-case.

THYREUS LUGUBRIS.

Plate XXVIII. fig. 2.

ORDER: Lepidoptera. SECTION: Crepuscularia. FAMILY: Sphingidæ, *Leach.*

GENUS. THYREUS, *Swains. Zool. Illustr. vol.* I.

THYREUS LUGUBRIS. Alis brunneis, anticis strigis undatis parallelis punctoque subocellari atris. (Expans. Alar. 2 unc. 9 lin.)

SYN. Sphinx Lugubris, *Linn. Mant.* 2. 537. *Fabr. Ent. Syst.* III. 1. 356. *No.* 5. *Gmel. Linn. S. N.* 2372. 50. *Abbot and Smith Ins. Georg.* 1. *t.* 30. *Swainson Zool. Illustr. 1st Series, vol.* 1.

HABITAT: Antigua (*Drury*). Georgia (*Abbot*).

Upper Side. Antennæ, head, thorax, and abdomen dark brown. The tail very broad and hairy. All the wings dark brown chesnut; having very few distinct marks or lines, except the anterior pair, which have a small black discoidal spot, and a very narrow line next the shoulders of a lighter brown, crossing them from the anterior to the posterior edges. The posterior wings are slightly, the anterior deeply, dentated.

Under Side. Thorax, legs, abdomen, upper and lower wings rather paler than on the upper side. On the anterior wings are two very faint brown lines, crossing them from the anterior to the posterior edges, situated between the middle and the external margin. On the posterior wings also are two small faint waved lines of a darker colour, beginning at the anterior edges and ending a little above the abdominal corners.

The caterpillar of this hawk-moth was found by Abbot on the Virginian Creeper. It went into the ground on the 18th of August, and the fly came out on the 11th of September. The tail of the male spreads like a fan. This is a very rare species; one was caught in the evening on a gourd blossom. It flew exceedingly swift, making a noise like a humble bee. The caterpillar is of a very pale greenish colour, with two dark dorsal lines, terminating at the base of the straight tail; the sides of the body are also ornamented with pale yellow oblique stripes, margined with brown. The chrysalis is chesnut, with a short point at the extremity of the body, and without any tongue-case.

DEILEPHILA TERSA.

Plate XXVIII. fig. 3.

ORDER: Lepidoptera. SECTION: Crepuscularia. FAMILY: Sphingidæ, *Leach.*

GENUS: DEILEPHILA, *Ochs.* Eumorphæ p. *Hübn.* Sphinx p. *Fabr.*

DEILEPHILA TERSA. Alis anticis griseis, lineis nonnullis obliquis parallelis nigris; posticis nigris fasciâ maculari luteo-albâ. (Expans. Alar. 3 unc.)

SYN. Sphinx Tersa, *Linn. Mant. p.* 538. *Drury, App. vol.* 2. *Cramer, tab.* 397. *fig.* C. *Fabr. Ent. Syst.* III. 1. *p.* 378. *No.* 69. *Gmel. Linn. S. N.* 2379. *No.* 71. *Abbot and Smith Ins. Georg.* 1 *tab.* 38.

HABITAT: Maryland, Jamaica, St. Christopher, Antigua *(Drury).* South America (*Fabricius*). Georgia (*Abbot*).

Upper Side. Head flesh-coloured; which colour, separating at the neck, runs on each side of the thorax to the abdomen. Thorax and abdomen dark clay colour. Abdomen pointed; the sides being of a yellower colour than the top. Anterior wings greyish olive brown; from the tips to the middle of the posterior margin run several narrow lines of lighter and darker colours, parallel with each other. Posterior wings, at the base, black; but along the external margin brown; having a row of narrow angular marks of a cream colour running from the anal angle to the anterior edges. Cilia white.

Under Side. Thorax and abdomen clay-coloured; paler on the middle than the sides. Wings red clay-coloured; the anterior brown in the middle, and the posterior having some faint waved lines crossing them; each wing having a row of faint small spots along their external margin.

The caterpillar of this insect, figured by Abbot and Smith, is of a pale green colour, with the three anterior segments elongated and attenuated in front, having seven beautiful white eye-like spots on each side, with a red pupil, and margined with black; the anterior ocellus being the largest. These ocelli are united by a lateral white line, terminating at the base of the straight red tail. It feeds upon the wild thyme (Spermacoce Hyssopifolia, Sm.) Some of them are stated by Abbot to be brown. One was observed by the same author to spin itself up on the 31st of July, from which the moth appeared on the 15th of August; whilst another which spun up on the 11th of September, remained in the chrysalis state until the 9th of May. When disturbed, the caterpillar contracts the anterior segments of the body.* The chrysalis is of a pale brown colour, freckled with darker marks. It is not provided with a porrected tongue-case.

* From the peculiar power of contraction and elongation possessed by these segments, and which is found in the caterpillars of other species of Deilephila, these insects have obtained the name of Elephant-hawk Moths.

COL·MBUS TENNOX

SPHINX STRIGILES.

Plate XXVIII. fig. 4.

ORDER: Lepidoptera. SECTION: Crepuscularia. FAMILY: Sphingidæ, *Leach.*

GENUS. SPHINX, *Auct.*

SPHINX STRIGILES. Alis integerrimis griseis, margine externo anticarum obscuro; posticis fulvis strigis tribus transversis fuscis. (Expans. Alar. 5 unc. 3 lin.)

SYN. Sphinx Strigiles, *Linn. Mant. p.* 538. *Cramer, tab.* 106. *f.* B. *Fabr. Ent. Syst.* III. 1. 364. *No.* 26. *Gmel. Linn. S. N.* 2377. *No.* 66.

HABITAT: Jamaica.

Upper Side. Head, thorax, and abdomen fawn-coloured; having on each abdominal segment a semicircle of a paler colour. A brown red spot is placed on each side the thorax, near the base of the upper wings, which are fawn-coloured; having a round spot of olive brown on each near the shoulders, and another on the middle of the posterior margin, between which and the anterior angle is a patch of a blueish brown; from this angle to the tip runs a small narrow border of yellow brown, with several short, faint, brown circular marks placed on different parts of the wing. Posterior wings pale orange; having three brown, narrow, waved lines crossing them in the middle, and with a narrow brown border.

Under Side. The mouth, thorax, thighs, abdomen, superior and inferior wings are all of a red clay colour. The border, along the external margin of the anterior wing, is of a much paler colour. Several reddish brown lines and marks are also placed on different parts of the wings.

SPHINX SATELLITA.

Plate XXIX. fig. 1. ♀.—fig. 2. ♂.

ORDER: Lepidoptera. SECTION: Crepuscularia. FAMILY: Sphingidæ. *Leach.*

GENUS. SPHINX, *Auctorum.*

SPHINX SATELLITA. Alis integris, fuscis badio griseoque variis, anticis puncto nigro, ocellari sesquialtero maculâque triangulari ad angulum analem nigrâ; posticis basi griseis. (Expans. Alar. 4¼ unc. ♂.—5½ unc. ♀.)

SYN. Sphinx Satellita, *Linn. Mant. p.* 539. *Fab. Ent. Syst.* III. 1. 370. *No.* 42. *Gmel. Linn. S. N.* 2391. 74. Sphinx Licaon, *Cramer.*?

HABITAT: Jamaica.

FEMALE.—*Upper Side.* Head and thorax pale olive brown, with dark brown dorsal and lateral lines; the latter edged with white, extending to the abdomen, where two small white streaks run obliquely across it. Abdomen light olive brown, paler on its sides; with two rows of dark brown dorsal spots, reaching almost to the extremity. Anterior wings olive grey; but from the middle of the anterior margin runs a shade of olive brown, ending at the external margin, and continuing towards the tips. Two small black discoidal spots, and a large squarish spot on the middle of the posterior margin of a very dark red brown; from whence to the shoulders extends a shade of paler brown. Posterior wings, next the shoulders, grey, but at the anal angle reddish ash colour; from whence runs a row of small black spots, which lose themselves in a very dark, brown, olive colour, occupying a large part of the wings near the exterior angle. Cilia pale brown.

Under Side. Thorax, thighs, and abdomen dark brown. Wings reddish brown, the posterior palest; and along the abdominal edges ash-coloured. There are very few marks of any sort observable on

this side, except a faint waved line which, crossing the superior and inferior wings, ends near the anal angle.

Male.—*Upper Side.* Head, thorax, abdomen, and anterior wings sandy yellow. The shades and clouds, which in the female are of olive brown, in this are of fine red brown, the two discoidal black spots being distinct. Posterior wings, next the shoulders, grey, as in the female; but along the external margin sandy yellow.

Under Side. The breast, abdomen, thighs, superior and inferior wings are, as on the upper side, the same sandy yellow; the faint waved lines, crossing both superior and inferior wings, being rather more conspicuous than in the female.

DEILEPHILA EUPHORBIÆ.

Plate XXIX. fig. 3.

Order: Lepidoptera. Section: Crepuscularia. Family: Sphingidæ, *Leach*.

Genus. Deilephila, *Ochs. Steph. &c.* Eumorphæ, *Hübn.* Sphinx, *Linn.*

Deilephila Euphorbiæ. Alis anticis virescentibus vittâ latâ luridâ maculâque disci virescente, posticis nigris fasciâ margineque exteriori roseis, abdomine cingulis (interruptis) albis. (Expans. Alar. 2 unc. 10 lin. ♂. 3 unc. 1 lin. ♀.)

Syn. Sphinx Euphorbiæ, *Linn. Syst. Nat.* 2. 802. *Donov. Brit. Ins.* 3. *pl.* 91. 92. *Fabr. Ent. Syst.* iii. 1. 367. *No.* 37. *Gmel. Linn. S. N.* 2383. 19. *Haworth Lep. Brit.* 61.
The Spotted Hawk Moth, *Harris Aurelian, pl.* 44. *f.* a. c.
Deilephila Euphorbiæ, *Ochs. Schmett.* iv. *p.* 43. *Curtis Brit. Ent.* 1. *pl.* 4.

Habitat: Holland, Germany (*Drury*). England, and other parts of Europe.

Upper Side. Head and thorax olive, having a white stripe on each side, which, beginning at the palpi and running across the shoulders, ends at the base of the abdomen; the olive colour extending along that part to its extremity. The first segment of the abdomen is black, the second cream colour, the remainder alternately cream colour and olive. The superior wings are of a flesh colour, having a narrow olive bar beginning at the tips, which, crossing them, ends at the posterior margin, widening gradually; an olive patch, the size of a small pea, is also placed on each next the shoulders, and another on the middle near the anterior edge. Cilia cream colour. The posterior wings black at the base; below which is a rose-coloured bar crossing them, next that is a narrow black indented bar, and beneath these the wing is flesh-coloured, with white cilia.

Under Side. The breast rose-coloured. The abdomen flesh-coloured, with cream-coloured rings. Wings faint rose and flesh-coloured; the anterior having a black spot in each, near the middle, and not far from the anterior edge.

Since the days of Drury this handsome insect has been ascertained to be a native of our island. It has, however, until lately been deemed one of the rarest as well as most beautiful species in the rare family to which it belongs. Entomologists are indebted not only for a considerable number of specimens, but, what is more interesting, for a knowledge of the habits of the insect to William Raddon, Esq. the celebrated engraver, by whom an interesting notice has been published in the Entomological Magazine. It feeds upon the sea

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spurge (Euphorbia paralias), which grows in plenty on the sand hills in the neighbourhood of Barnstaple and Braunton Burrows, in Devonshire. These sand hills are of great extent, and, as suggested by Mr. Curtis, must have been collected by the winds and storms to which they are constantly exposed. During the winter the whole soil is frequently removed, so as completely to alter the surface of the country; a great number of the pupæ must consequently be destroyed or buried at a considerable distance below the surface, where probably they lie hid until they are brought to light and life by the influence of the elements. These circumstances account for the great irregularity in the appearance of the insects. In 1814, for instance, they were so plentiful that Mr. Raddon found not less than one hundred minute larvæ upon an armful of spurge, which he had cut at dusk the preceding evening. The rarity of the insect is also increased by the difficulty of rearing it. The late Mr. Fuseli, the royal academician, who was a zealous entomologist, was enabled only to obtain one moth from twenty chrysalides. The larvæ are full grown in September, and the moth appears in the following June.

DYNASTES HERCULES.

Plate XXX. fig. 1. ♂—2. ♀.

ORDER: Coleoptera. SECTION. Lamellicornes. FAMILY: Dynastidæ, *Mac Leay.*

GENUS. DYNASTES, *Mac Leay.* Geotrupes, *Fabricius.* Scarabæus, *Latreille, Linnæus, &c.*

DYNASTES HERCULES. Thoracis ♂ cornu incurvo longissimo subtus barbato utrinque unidentato, capitis recurvato dentato. (Long. Corp. 5 unc. 8 lin. ♂.)

SYN. Scarabæus Hercules, *Linn. Syst. Nat.* 2. 541. 1. *Oliv. Ins.* 1. 3. *b.* 1. *tab.* 1. *f.* 1. *tab.* 23. *fig.* 1. *Fabr. Ent. Syst.* 1. *p.* 2. *No.* 1. *Naturalists' Library, Beetles, pl.* 11. *Edwards, Birds, t.* 334. *Gronov. Zooph.* 412. *Johnst. Ins. t.* 16. *f.* 1. *Petiv. Gaz. t.* 70. *f.* 1. *Roesel. Scar. tom.* iv. *t.* 5. *f.* 3. *Pal. Beau. Ins. d'Afr. & d'Amer. Col. Pl.* 1. *c. f.* 1. *Marcgr. Braz.* 241. *fig.* 3.

HABITAT: Gaudaloupe (*Drury*). South America.

Male. Black, except the elytra, which are of an olive colour; having a number of black spots on them of different shapes and sizes, varying considerably in different individuals. Thorax, above, smooth, and shining, the sides covered with a multitude of small punctures. Its front is produced into a long shining horn, near three inches in length, which gradually bends downwards from the base to the extremity, where it is slightly forked; the under side being covered with short fine hairs of a yellowish colour, resembling the pile of velvet, and having about two inches from its extremity a strong short spine placed on each side. The head is furnished with another horn, about two-thirds the length of the first, sharp and thin on its upper side, and towards the end bending upwards; having on the upper edge, near the middle, three or four teeth or strong spines, and another near the extremity. Eyes shining, red brown. Tibiæ armed with spines, particularly the anterior pair, which have four; three near the tips, and one near the middle. The middle and hinder tibiæ have each two strong spurs, and several smaller spines, surrounded with hair on the other parts. The edge of the abdomen is covered with a row of dark orange-coloured hairs. Several other parts of the body, joints, &c. are also clothed with the same

coloured hairs. Each of the ungues has a little tuft of strong hairs issuing from the extremity of the terminal joint of the tarsi.

Female. This sex is unfurnished with horns. The elytra are the same colour as in the male, not spotted so much, if at all, and more rugose. Thorax black, with a few yellowish spots, formed like stars or rays on it. In other respects it resembles the male.

Drury adds to this insect the following remark—"I have observed many species of beetles whose males have been furnished with horns, either on the head or thorax, but in which the females have none, but have those parts quite smooth and plain; and my observations incline me strongly to think that this rule subsists in every one of them, through the whole class. The instances I could bring in support of this opinion are too many to be admitted in this place."

The circumstance observed upon in the preceding note is certainly very interesting in a physiological point of view. In quadrupeds we find both sexes of cornuted species armed with horns; but in insects almost universally the males alone are provided with these appendages. It is also worthy of remark, that although in the majority of insects the females considerably surpass the males in size, yet in those species in which the males are cornuted, the females are almost invariably smaller than their partners.

Burmeister lays it down as a rule, that with regard to the differences of the sexes, their whole character may be thus distinguished; viz. that the male displays a preponderance of evolution, and the female a preponderance of involution; and observes, "that some beetles have processes upon the head and thorax, which, like the mandibles, can meet, like tongs, and thus serve as a weapon. This is asserted of Hercules and its large comrades." This opinion as to the uses of these horns can, however, scarcely be maintained, since the number of species in which the horns really meet is very few. Kirby and Spence observe, "What may be the use of these extraordinary appendages to the males, has not yet been ascertained. Whether the individuals of this sex are more exposed to the attack of birds and other enemies, in consequence of being more on the wing than the females, and are therefore thus provided with numerous projecting points of defence, is a question worth considering." It is also to be observed that these appendages, instead of being deciduous, as in many of the higher animals, are in insects component parts of the external skeleton.

There are a few exceptions to the observation of Drury; thus in the Lamellicorn genus Hoplites Dej. Catal. (Scarabæus Pan,) the females are cornuted as well as the males; and in the genus Osmia, belonging to the section of wild bees, Dasygastres, Latr., the females alone have the head furnished with two porrected horns.

BUPRESTIS (CHALCOPHORA) VIRGINIENSIS.

Plate XXX. fig. 3.

ORDER: Coleoptera. SECTION: Serricornes. FAMILY: Buprestidæ.

GENUS. BUPRESTIS, *Linn.* SUBGENUS. Chalcophora, *Solier.*

BUPRESTIS (CHALCOPHORA) VIRGINIENSIS. Thorace lato fusco, punctis cupreis; elytris serratis atris, maculis cupreis, saturâque metallicâ. (Long. Corp. 1 unc. 1½ lin.)

SYN. Buprestis Virginiensis, *Drury, App. vol.* 2. *Herbst. Col.* ix. *p.* 114. 63. *t.* 148. *f.* 1.
Buprestis Virginica, *Linn.* (*Gmel.*) t. iv. *p.* 1940. *No.* 110. *Rossi* (*Hellw.*) *Fn. Etr.* t. *p.* 211. *not.*

HABITAT: Virginia.

Head small and broad. Antennæ about the length of the thorax, and small. Thorax broad and rugged, having the elevated parts of a dark coppery colour; but the depressed ones lighter, covered with very small punctures, and joining close to the wing-cases. Scutellum very small and triangular. Elytra of the same colour with the thorax; the dark parts in the figure being those that lie highest. They are margined on the sides and suture, extending even with the anus; which near their edges are slightly serrated. Under side shining and coppery, but on the sides with a tincture of flesh colour. Legs the same; with two tibial spurs.

GOLIATHUS GIGANTEUS.

Plate XXXI. fig. 1.

ORDER: Coleoptera. SECTION: Lamellicornes. FAMILY: Cetonidæ.

GENUS, GOLIATHUS, *De Lamarck.* Cetonia, *Oliv.* Scarabæus, *Linn, &c.*

GOLIATHUS GIGANTEUS. Thorace piceo, nudo, holosericeo-albo lineato; elytris glaucis, clypeo porrecto bifido. (Long. Corp. 4 unc. 3 lin.)

SYN. Goliathus Giganteus, *Kirby in Introd. to Ent. vol.* 3. *p.* 33. *v.* 4. *p.* 493.
Scarabæus Goliathus, *Linn. Mant.* 5. 30.
Cetonia Goliata, *Fabr. Ent. Syst.* t. 2. *p.* 124. 1.
Cetonia Goliathus, *Olivier*, 1. *No.* 6. *pl.* 5. *f.* 33.
Goliathus Magnus, *Naturalist's Library, Beetles, pl.* 16.
Goliathus Africanus, *De Lamarck Anim. sans Vert.*

HABITAT: Western Africa, near the Equinoctial line.

Head, above, flesh-coloured; beneath, black; about three-fourths of an inch in length, terminating in two blunt, obtuse, and irregular horns. Two other thick and jagged horns also arise from its sides, much shorter than the former. Its breadth at the base is half an inch; having a small projecting ridge running along the middle, from thence to the extremity, at the base of the horns. Thorax an inch and a half long, being principally black; but along the sides is flesh-coloured. It has also five narrow and irregular waved lines of a flesh colour running from the anterior to the posterior edges; one of which, being in the middle of the thorax, is narrower than the rest; the two next this terminate at the posterior edges in a fine rose colour; these next the lateral edges are broadest, having likewise a patch of rose colour next the wing-cases. About the middle of the thorax, these external lines separate and divide, continuing so almost to the anterior edges, where they again unite. The under part of the thorax is flesh colour; but in the middle of a yellowish brown. The scutellum is triangular and black; with a clear white central oblong mark truncated in front. Elytra beautiful chocolate-coloured, and

covered with a great number of short fine hairs, resembling the pile on velvet; the anterior part, with a narrow and indented margin, of a cream colour, also surrounding the scutellum. The elytra are two inches broad at the base. Legs very dark green colour, almost black. Intermediate and posterior femora and tibiæ with dark yellow hairs. Abdomen very dark green, furnished on the sides and edge with dark yellow hairs. Sternum rather long.

This magnificent insect may be regarded as one of the rarest species figured in these Illustrations. Drury states, that the specimen here represented was brought from Africa by Mr. Ogilvie, surgeon of His Majesty's ship the Renown, being found floating, dead, in the river Gaboon, opposite Prince's Island, near the equinoctial line. Nearly seventy years have elapsed since the insect was first described, and yet the insect remains, as far as my knowledge extends, unique.* It would appear that the specimen either belonged to or passed into the hands of Dr. Hunter after the death of Mr. Drury, for Fabricius describes the species with a citation of the museum of Dr. Hunter alone; and Olivier's figure was taken from the specimen whilst it was in that gentleman's possession. After his decease it passed, with his collection, by bequest, into the possession of the University of Glasgow, where it now forms one of the most interesting objects in the Hunterian Museum. Joseph Hooker, Esq., son of Sir W. Hooker, the highly distinguished botanist of Glasgow, tells me that the individual in question was picked up by a sailor in the river above mentioned, and that it is stated in the MSS. of Dr. Hunter that it cost Mr. Drury £10. In the Catalogue of the Insects of Mr. Drury, which were sold by auction at the Natural History Sale Rooms in King Street, Covent Garden (now occupied by Mr. J. C. Stevens), on the 23rd of May, 1805, and two following days, the 95th lot is described as "Scarabæus Goliathus, *var.*" Whence it would appear that the insect here figured was not in the possession of Mr. Drury at his decease, and that he only possessed the insect figured in the 3rd volume of these Illustrations, pl. 40, which evidently on the authority of Fabricius he had regarded as a variety only of the specimen here figured.

The genus Goliathus is exceedingly interesting, not only on account of the gigantic size and singular form of the species of which it is composed, but also from the geographical range of the group. Mr. Kirby observes upon this subject, "Mr. W. S. Mac Leay has remarked to me that Goliathus Lam. appears to belt the globe, but not under one form. The types of the genus are the vast African Goliaths (G. giganteus, &c.), which, as well as G. Polyphemus, and another brought from Java by Dr. Horsfield, have, like Cetonia, the scapulars interposed between the posterior angles of the prothorax and the shoulders of the elytra, while the South American species (G. micans,† &c.) have not this projection of the scapulars; in this resembling Trichius; Mr. Mac Leay further observes, that the

* Since this was written, I have been favoured by Mr. Mac Leay with an inspection of his magnificent collection, which possesses a Goliathus, nearly resembling the insect here figured, and which that gentleman considers as a variety of this. It is, however, considerably smaller, and the horns of the head are not so much developed.

† Goliath. micans is an inhabitant of Africa, and not of South America, it is figured in the 2nd vol. of these Illustrations, pl. 32.

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female of the Javanese Goliathus is exactly a Cetonia, while that of the Brazilian is a Trichius."—*Introd. to Entomology*, vol. 4. p. 494.

Since the publication of this passage, the genus Goliathus has undergone a considerable revision; the South American species, Cetonia Ynca, *Fabr.* barbicornis, *Mac Leay*, &c., have been separated from the genus by Saint Fargeau and Serville in the Encyclopédie Méthodique, under the generic name of Ynca, and the Javanese species above noticed (Gol. Rhinophyllus* *Wiedemann*) is stated by Latreille in the Règne Animal, 2nd edition, not to belong to the genus Goliathus, but to that of Cetonia. The genus is thus restricted to the African species,† with the exception of a Mexican insect which Dejean has named Goliathus Hoffneri. The genus Ynca may thus be regarded rather as a geographical subgenus, or type of form belonging to and representing the African species of Goliathus.

DIAPREPES SPENGLERI.

Plate XXXII. fig. 1.

ORDER: Coleoptera. SECTION: Rhyncophora. FAMILY: Curculionidæ. SUBFAMILY: Brachyderides.

GENUS. DIAPREPES, *Schonherr*. Chlorima, *Dej*. Curculio, *Linn. &c.*

DIAPREPES SPENGLERI. Niger, thorace albo-squamoso, elytris squamositate flava vestitis, saturâ, margine striisque tribus elevatis, nudis, nigris, notatis. (Long. Corp. 7 lin.)

SYN. Curculio Spengleri, *Linn. Syst. Nat.* 1. 2. 609. 32. *Fabr. Syst. Eleuth.* 2. 532. *No.* 149. *Oliv. Ent. V.* 83. 311. *No.* 345. *t.* 2. *f.* 15. *C. T.* 20. *f.* 254. *Herbst. Col.* 6. *t.* 68. *f.* 11. *& T.* 69. *f.* 1. *Schonh. Syn. Ins. Curcul.* 2. *p.* 8. *No.* 1.
Curculio Aurifer, *Drury, App. vol.* 2.

HABITAT: Jamaica.

Head black, long, and rostrated; as long as the thorax, which is also black. They are both striped underneath with streaks of a shining, golden, green colour. Scutellum very small. Elytra dark brown, extending very low down the sides, and terminating in a point, double margined. The abdomen dark brown, and, with the wing-cases, adorned with many oblong spots or streaks, of a golden green colour. Femora simple, and dark brown. Tibiæ hairy, particularly within. Underside of the tarsi brown yellow.

The golden spots, or streaks, on this insect vary very much; in some individuals being ash-coloured, some blue, and in others nearly white. The colour also of the wing-cases in some is almost black, in others of a red brown.

* The female of this insect and two other new species of Goliathus, are described by M. L. Buquet, in the Annales de la Société Entomologique de France, for 1835 and 1836.

† Hence I have not adopted De Lamarck's specific name Africanus, which is of course applicable to all the species.

COPRIS MOLOSSUS.

Plate XXXII. fig. 2.

ORDER: Coleoptera. SECTION: Lamellicornes. FAMILY: Scarabæidæ.

GENUS. COPRIS, *Geoffroy*. Scarabæus, *Linn.*

COPRIS MOLOSSUS. Thorace retuso bidentato, utrinque impresso; clypeo lunato unicorni integro, elytris lævibus. (Long. Corp. 2 unc.)

SYN. Scarabæus Molossus, *Linn. Syst. Nat.* 1. 11. *p.* 543. *No.* 8. *Fabricius Ent. Syst.* 1. *p.* 51. *No.* 167. *Olivier*, 1. 3. *t.* 5. *f.* 37. ♂. *t.* 4. *fig.* 25. *De Geer. Ins.* 1. *t.* 32. *f.* 2. *Schonherr Syn. Ins. p.* 43.

HABITAT: China.

Entirely black. Head broad and thin, rounded in front and margined; having a strong erect horn, near half an inch long. Thorax margined, and much elevated, terminating upwards in an high ridge, whose sides are furnished with two short horns, varying very much in their length (the females being entirely hornless); it is also, as well as the head, regularly covered with innumerable small pustules, which are scarce visible to the naked eye. Scutellum obsolete. Elytra margined, short, and almost smooth. Femora broad, hairy, and strong. Tibiæ with strong spurs. Ungues very small, scarcely visible.

PHILEURUS DIDYMUS.

Plate XXXII. fig. 3.

ORDER: Coleoptera. SECTION: Lamellicornes. FAMILY: Dynastidæ.

GENUS. PHILEURUS, *Latreille*. Geotrupes, *Fabr.* Scarabæus, *Linn.*

PHILEURUS DIDYMUS. Depressus, thorace fossulâ excavatâ, capite tricuspide, elytris striatis. (Long. Corp. 2 unc.)

SYN. Scarabæus Didymus, *Linn. Syst. Nat.* 1. 11. *p.* 545. *No.* 19. *Fabr. Ent. Syst.* 1. *p.* 20. *No.* 61. *Oliv. Ent.* 1. 3. *p.* 42. *No.* 46. *t.* 2. *fig.* 9. *Schonherr Syn. Inst.* 1. *p.* 19. *No.* 85. *Pal. Bauv. Ins. Col. pl.* 16. *f.* 3.

HABITAT: (——? *Drury*). America (*Fabricius*).

Head, black, small, and triangular, having three tubercles issuing from it, of which the anterior is pointed, the others blunt. Thorax black, which is the general colour of the insect, rounded, smooth, and margined, having an impression in front, with a short tubercle situated on it near the edge; from whence runs a hollow groove or channel to the posterior margin. Scutellum small. Elytra shining, margined and furrowed. Abdomen smooth and shining, without hair. Tibiæ furnished with spines, as are the first joints of the middle and posterior tarsi.

BRACHYCERUS GLOBOSUS.

Plate XXXII. fig. 4.

ORDER: Coleoptera. SECTION: Rhyncophora. FAMILY: Curculionidæ. SUBFAMILY: Brachycerides.

GENUS. BRACHYCERUS. *Fabr.* Curculio, *Linn. &c.*

BRACHYCERUS GLOBOSUS. Ovatus niger, rostro varioloso, subcarinato, medio bifoviolato, basi bi-tuberculato, thorace utrinque spinoso, quinque sulcato, postice truncato, elytris lævibus. (Long. Corp. 9 lin.)

SYN. Curculio Globosus, *Drury, App. vol.* 2. *Fabr. Syst. Eleuth.* 2. 413. *No.* 6. *Oliv. Ent. V.* 82. *p.* 47. *No.* 6. *t.* 2. *f.* 10. *Schonh. Syn. Ins. Curcul.* 1. 392. *No.* 9.

HABITAT: Cape of Good Hope.

Head black, long, and rough above. Antennæ short, gradually increasing in size from the base. Thorax black, and very rough; each side terminating in a thick spine or tubercle. Elytra black, smooth, and round, and reaching so far down the sides of the abdomen as almost to meet underneath, being rather longer than the head and thorax. Femora and tibiæ partly black, and partly of a dirty orange; being covered in several parts with a kind of pile of the colour last mentioned. Scutellum obsolete. Each of the ungues furnished with a spine.

HIPPORHINUS VERRUCOSUS.

Plate XXXII. fig. 5.

ORDER: Coleoptera. SECTION: Rhyncophora. FAMILY: Curculionidæ. SUBFAMILY: Entimides.

GENUS. HIPPORHINUS, *Schonh.* Bronchus, *Germar.* Curculio, *Linn. &c.*

HIPPORHINUS VERRUCOSUS. Elongato-ovatus niger, æneo-micans, rostro quasi abscisso, quinque sulcato, thorace confertim tuberculato, elytris seriato-tuberculatis apice singulatim verrucâ crassâ auctis. (Long. Corp. 1 unc. 3 lin.)

SYN. Curculio Verrucosus, *Linn. Syst. Nat.* 12. *p.* 618. *No.* 90. *Fabr. Syst. Eleuth.* 2. 534. *No.* 161. *Herbst. Col.* 6. 308. *t.* 84. *fig.* 6. *Schonh. Syn. Ins. Curcul.* 1. 481. 27.

HABITAT: Cape of Good Hope.

General colour brassy black. Head long, and furnished with a thick rostrum, whereon are placed the antennæ. Thorax rounded, and regularly covered with small pustules. Head and thorax almost the length of the elytra, which are long, brassy, and covered with several rows of tubercles; some being small and round, others larger and oblong; they extend very deeply down the sides of the abdomen, and at their extremities terminate in two swellings. Scutellum obsolete. Femora simple. Posterior tibiæ very crooked.

LAMIA (STERNOTOMIS) PULCHRA.

Plate XXXII. fig. 6.

ORDER: Coleoptera. SECTION: Longicornes. FAMILY: Lamiidæ.

GENUS. LAMIA, *Fabr. &c.* Cerambyx p. *Linn. &c.* SUBGENUS, Sternotomis, *Percheron.*

LAMIA (STERNOTOMIS) PULCHRA. Nigra, thorace transversè fulvo trifasciato, elytris fulvo maculatis et variegatis, maculis interdum viridi-cinctis. (Long. Corp. fere 1 unc. 3 lin.)

SYN. Cerambyx Pulcher. *Drury, App. vol.* 2. (nec C. pulcher Fabr. qui ad C. mirabilem *Drurii* pertinet.)
Lamia blanda, *Schonh. Syn. Ins.* 3. 378.
Lamia ornata, *Pal. Beauv. Ins. d'Afr. et d'Amer. Col. Pl.* 37. *f.* 1.
Lamia regalis, *Fabr.*? *Syst. Eleuth.* 2. 286.

HABITAT: Jamaica.

Head orange colour, encircled with black stripes. Antennæ black, being a little longer than the insect. Thorax orange-coloured, encircled with black rings; having a single spine on each side. Elytra with orange-coloured clouds and spots on them, separated by black partitions, some being margined with green. Abdomen orange-coloured, the middle being of a dirty green. Femora simple, dark green. Tibiæ the same.

CETONIA AURATA, var. γ.

Plate XXXIII. fig. 1.

ORDER: Coleoptera. SECTION: Lamellicornes. FAMILY: Cetoniidæ.

GENUS. CETONIA, *Fabricius*. Scarabæus, *Linn*.

CETONIA AURATA. Segmento abdominis primo lateribus unidentato, elytris lineolis transversis albis. (Long. Corp. 9 lin.)

SYN. Scarabæus Pallidus, *Drury, App. v.* 2. *Herbst. Col.* III. *p.* 247. 35. *tab.* 31. *fig.* 2.
Cetonia Aurata, *Duftschm. Fn. Aust.* 1. *p.* 166. 3. *Schonh. Syn. Ins.* III. *p.* 119. *No.* 37. γ.

HABITAT: Smyrna (*Drury*).

General colour above, rusty copper; beneath, shining purple. Thorax smooth, margined, and narrow in front. Elytra margined, and near their extremities a little protuberant. On the first joint of the abdomen are two scales lying close under the hinder thighs, which are thin and sharp on their edges, but next the body are thick and strong.* The breast is a little hairy. Tibiæ dentated and hairy, except the fore ones. Each of the tibiæ with two spurs.

CETONIA FASCICULARIS.

Plate XXXIII. fig. 2.

ORDER: Coleoptera. SECTION: Lamellicornes. FAMILY: Cetoniidæ.

GENUS. CETONIA, *Fabricius*. Scarabæus, *Linn*.

CETONIA FASCICULARIS. Thorace lineis quatuor albis, elytris viridibus, abdominis incisuris barbatis. (Long. Corp. 1 unc.)

SYN. Scarabæus Fascicularis, *Linn. Syst. Nat.* 1. II. *p.* 557. 75.
Cetonia F. *Fabricius Syst. Eleuth.* 2. *p.* 144. 45. *Olivier Ent.* 1. 6. *p.* 16. 12. *t.* 11. *f.* 108. *Schonh. Syn. Ins.* 3. 126. 67. *Petiv. Gazoph. t.* 8. *f.* 6. *Roesel. vol.* 2. *tab.* B. *f.* 6.

HABITAT: Cape of Good Hope.

Head black, small, and quadrangular. Antennæ black. Thorax black, smooth, and shining; with a white margin on its sides, and two white lines running from the neck to the posterior edge, being placed nearly at equal distances. Scutellum triangular, black, and shining. Elytra dark green. Each joint of the abdomen is covered with tufts of orange-coloured hairs on its sides. Femora and tibiæ, particularly the fore ones, hairy. The middle of the breast and abdomen is black and shining. Anterior tibiæ with four spines and teeth; the middle ones with six, and the hind ones with five.

* These scales, which Drury in his description called "the abdominal scales," are the dilated trochanters of the posterior pair of legs.

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CETONIA CAPENSIS.

Plate XXXIII. fig. 3.

ORDER: Coleoptera. SECTION: Lamellicornes. FAMILY: Cetoniidæ.

GENUS. CETONIA, *Fabricius*. Scarabæus, *Linn.*

CETONIA CAPENSIS. Rufa hirta, punctis albis adspersa. (Long. Corp. 10 lin.)

SYN. Scarabæus Capensis, *Linn. Syst. Nat.* 1. 11. *p.* 556. 73. *Fabr. Syst. Eleuth.* 11. *p.* 144. 48. *Olivier Ent.* 16. *p.* 27. 28. *t.* 6. 38. *a b. Herbst. Col.* 111. *tab.* 29. *f.* 12. *Schonh. Syn. Ins.* 111. 127. 71.
Scarabæus albo punctatus, *De Geer Ins.* vii. p. 640. 40. *t.* 48. *f.* 2.

HABITAT: Cape of Good Hope.

Head margined, black, and nearly quadrangular. Antennæ black. Thorax margined, and of a dark chocolate colour; which, with the elytra and scutellum, are hairy, and embellished with a great number of white spots. The latter is black and shining. Elytra fine chocolate-coloured, and faintly margined (the suture being black), not covering the anus. The under part of the insect is covered with pale clay-coloured hairs; but on the fore femora, and next the head, the hairs are browner.

CETONIA FASTUOSA.

Plate XXXIII. fig. 4.

ORDER: Coleoptera. SECTION: Lamellicornes. FAMILY: Cetoniidæ.

GENUS. CETONIA, *Fabricius*. Scarabæus, *Linn.*

CETONIA FASTUOSA. Ænea nitidissima, immaculata. (Long. Corp. 4 unc.)

SYN. Cetonia Fastuosa. *Fabr. Syst. Eleuth.* 11. *p.* 137. 10. *Panzer Faun. Ins. Germ.* xii. 16.
Cetonia Aurata var. *Olivier Icon.* 6. *tab.* 1. 1. *f.* 1. *f.*
Scarabæus æruginosus, *Drury, p.* 72. (Exclus. *Syn. Linn.*)

HABITAT: Smyrna (*Drury*). South of Europe (*Fabricius*).

Entirely shining golden green-coloured, except the antennæ, which are blackish. Head margined, small, and quadrangular. Thorax smooth and margined. Scutellum triangular. The elytra margined, having two little swellings near the extremities, and not extending beyond the anus. The breast and abdomen are smooth. Mesosternum extending beyond the middle thighs. Tibiæ armed with spines at the tips, and the fore ones deeply dentated.

GYMNETIS NITIDA et var.

Plate XXXIII. fig. 5. 6.

ORDER: Coleoptera. SECTION: Lamellicornes. FAMILY: Cetoniidæ.

GENUS. GYMNETIS, *Mac Leay.* (*Horæ Ent.* 1. *p.* 1. *p.* 152.) Scarabæus, *Linn.*

GYMNETIS NITIDA. Glabra viridis, thoracis et elytrorum marginibus testaceis, tibiis haud dentatis, capite spinâ recumbente. (Long. Corp. fere 10 lin.)

SYN. Gymnetis Nitida, *Mac Leay Horæ Ent.*
Cetonia Nitida, *Fabr. Syst. Eleuth.* 11. *p.* 139. 24. *Olivier Ent.* 1. 6. *p.* 18. 14. *t.* 3. *f.* 16. *& tab.* 7. *f.* 56. a, b, c.
Scarabæus N. *Linn. Syst. Nat.* 1. 11. *p.* 552. *No.* 51. *De Geer, vol.* 14. *t.* 19. *f.* 8, 9.

HABITAT: Antigua, St. Christopher's, Jamaica, Maryland, New York, Virginia, &c. (*Drury*).

Head green, small, quadrangular, and margined. On the front is a tubercle, like a short thick horn; in the middle is another lying flat. Thorax margined, and of a dark green colour, but round the sides of a dirty clay colour. Elytra faintly margined; in some specimens being of a dark green, with a dark orange border on the sides; in others almost entirely of a dark orange, and in others party-coloured. Thorax terminating between the wing-cases, like an obtuse angle; but a microscope discovers something like a scutellum. Breast and abdomen shining green, and not hairy. The femora and tibiæ clay-coloured; but when held in particular positions, seem of a shining green. Posterior trochanters distinct.

MACRASPIS TETRADACTYLA.

Plate XXXIII. fig. 7.

ORDER: Coleoptera. SECTION: Lamellicornes. FAMILY: Rutelidæ.

GENUS. MACRASPIS, *Mac Leay.* Cetonia, *Fabr.* Scarabæus, *Linn.*

MACRASPIS TETRADACTYLA. Atra, scutello elytris dimidio breviore, pedibus triunguiculatis, pollice fixo. (Long. Corp. circ. 1 unc.)

SYN. Scarabæus Tetradactylus, *Linn. Mant.* 530. *Sloane Jamaica, t.* 237. *f.* 2.
Cetonia T. *Fabr. Syst. El.* II. *p.* 151. 80. *Olivier Enc.* 1. 6. *p.* 74. 93. *t.* 2. *f.* 8. & *t.* 7. *f.* 53.

HABITAT: Jamaica.

Entirely deep shining black. Front of the head margined, from whence underneath appear two lips. Thorax margined. Elytra not margined, nor covering the anus. Scutellum remarkably large and long, reaching half way down the wing-cases. Posterior trochanters distinct. Sternum long. Tibiæ dentated, and armed with spines, particularly at the tips; tarsal joints also furnished with spines. Ungues composed of two principal hooks, which divide and separate as usual; but one has an immoveable lesser hook within it, and likewise a long spine fixed to the last tarsal joint of equal length with the hooks, as shewn in the figure near the insect.

GYMNETIS LANIUS.

Plate XXXIII. fig. 8.

ORDER: Coleoptera. SECTION: Lamellicornes. FAMILY: Cetoniidæ.

GENUS. GYMNETIS, *Mac Leay.* Scarabæus, *Linn.* Cetonia, *Fabr.*

GYMNETIS LANIUS. Livida, thorace punctis duobus, elytris maculis pluribus nigris, sterno antice cornuto. (Long. Corp. fere 1 unc.)

SYN. Scarabæus Lanius, *Linn. Syst. Nat.* I. II. *p.* 557. *No.* 77?
Cetonia L. *Fabricius Syst. El.* II. *p.* 141. 34. *Olivier Ent.* 16. *p.* 19. 15. *t.* 2. *f.* 4. *Sloane Jamaica,* II. *tab.* 237. *f.* 7. 8?

HABITAT: Jamaica.

Head quadrangular, with a black margin. Antennæ brown. General colour dirty clay. Thorax faintly margined, terminating between the wing-cases in a blunt angle, having four black spots on the top near the head. Elytra with a great number of black spots of different shapes sprinkled all over them. Scutellum concealed. Femora hairy. Tibiæ the same, except the fore ones; all of which are party-coloured, being at the base clay colour, and at the tips black. The tarsi and ungues black. Posterior trochanters large and strong. Sternum long, and inclined from the body.

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COLMSON ESTIM

DYNASTES SATYRUS.

Plate XXXIV. fig. 1. ♂.—2. ♀.

ORDER: Coleoptera. SECTION: Lamellicornes. FAMILY: Dynastidæ.

GENUS: DYNASTES, *Mac Leay.* Geotrupes, *Fabricius.* Scarabæus, *Linn. &c.*

DYNASTES SATYRUS. Thorace inermi antice truncato; capitis cornu recurvo capite longiori ♂; clypeo tuberculato, thorace plano. (Long. Corp. 1 unc. 3 lin.)

SYN. Geotrupes Satyrus, *Fabr. Syst. Eleuth.* 1. 15. *No.* 49.
Scarabæus S. *Fabr. Spec. Ins.* 1. 12. *No.* 42. *Olivier Ent.* 13. *p.* 39. *t.* 11. *f.* 94. a. b.
Scarabæus Jamaicensis, *Drury, App. vol.* 2. *Jablonsky, Nat. S.* 11. *p.* 83. *No.* 68. *t.* 9. *fig.* 8. 9. (nec Scar. Jamaicensis, *Fabr. Oliv.*)

HABITAT: New York.

Male. Head black, and furnished with a single horn terminating in a point, and bending backwards, having in front two small protuberances; hairy beneath. Thorax black, shining and margined; the upper part elevated, and appearing almost perpendicular. Elytra margined and furrowed; also black, as is the anus. Abdomen reddish brown, with dark yellow hairs. Thighs brown, almost black; broad, strong, and hairy. Anterior tibiæ deeply dentated with a strong spine at the tips, and hairy. Middle tibiæ strong, and very spinose; particularly at the tips, where there are two long ones on each, which are likewise very hairy. Ungues very small. Scutellum triangular and small.

Female. Resembles the male in every part but the thorax and head; the former being quite smooth and convex without any prominence, and the latter, in the room of a horn, has a small protuberance, just discernible by the naked eye.

DYNASTES ANTÆUS.

Plate XXXIV. fig. 3. ♂.—4. ♀.

ORDER: Coleoptera. SECTION: Lamellicornes. FAMILY: Dynastidæ.

GENUS. DYNASTES, *Mac Leay.* Geotrupes, *Fabricius.* Scarabæus, *Linn. &c.*

DYNASTES ANTÆUS. Thorace tricorni; cornu intermedio longiori simplici, capite mutico, elytris lævissimis. (Long. Corp. fere 1 unc. 3 lin.)

SYN. Scarabæus Antæus, *Drury, App. vol.* 2. *Fabr. Ent. Syst.* 1. *p.* 12. *No.* 31. *Olivier Ent.* 1. 3. 24. *No.* 23. *t.* 12. *f.* 105. ♀ *t.* 13. *f.* 124. a. b.
Geotrupes A. *Fabr. Syst. Eleuth.* 1. *p.* 12. *No.* 36. *Pal. Beauv. Ins. d'Afr. et d'Amer. Col. Pl.* 1. *fig.* 5. 6.

HABITAT: Jamaica.

Male. Head black, with two small protuberances like teeth in front. Thorax black, smooth, shining, and margined; having three horns on it, each of which is about a third of an inch in length; two of which are placed near the elytra, almost erect, inclining towards each other, but with their points inclining to the wings; the third arises from the front of the thorax, bending backwards in a curved direction. Elytra brown, very smooth, shining, and margined. Scutellum triangular. Abdomen red, brown, and hairy. Tibiæ the same colour, and hairy, all of them being armed with spines, principally about the tips.

Female. Resembles the male in every respect except the horns, which are wanting in that sex.

PELIDNOTA PUNCTATA.

Plate XXXIV. fig. 5.

ORDER: Coleoptera. SECTION: Lamellicornes. FAMILY: Rutelidæ.

GENUS. PELIDNOTA, *Mac Leay*. Scarabæus, *Linn.*

PELIDNOTA PUNCTATA. Testacea, elytrorum singulo punctis tribus fuscis distantibus. (Long. Corp. fere 1 unc.)

SYN. Scarabæus Punctatus, *Linn. Syst. Nat.* 1. 11. *p.* 557. 76.
Melolontha P. *Fabricius Syst. El.* 11. *p.* 166. 28. *Olivier Ent.* 1. 5. *p.* 22. *t.* 1. *f.* 6. a. b. *Herbst. Col.* 111. *p.* 69. 16. *t.* 23. *f.* 6.

HABITAT: New York, Virginia, Maryland, Antigua.

Head brown orange; but round the eyes (which are black) and next the thorax of a shining brassy green. Thorax and elytra brown orange, and faintly margined; the former with two small black spots, and the latter with three on each side, one close to the thorax, another near the corner of the wing-cases, and the third in the middle. Scutellum shining bright green. Abdomen and legs greenish black. Tibiæ spinose and denticulated, especially at the tips; the three middle articulations of the tarsi are also furnished with spines.

AREODA LANIGERA.

Plate XXXIV. fig. 6.

ORDER: Coleoptera SECTION: Lamellicornes. FAMILY: Melolonthidæ.

GENUS. AREODA, *Leach, Mac Leay*. Melolontha, *Fabr.* Scarabæus, *Linn.*

AREODA LANIGERA. Capite thoraceque aureis, elytris luteis, corpore subtus lanato. (Long. Corp. fere 1 unc.)

SYN. Scarabæus Lanigerus, *Linn. Syst. Nat.* 1. 11. *p.* 555. 67.
Melolontha L. *Fabr. Syst. El.* 11. *p.* 165. 26. *Oliv. Ent.* 1. 5. *p.* 21. 17. *t.* 4. *f.* 39. a. b. *Herbst. Col.* 111. *p.* 152. 109. *t.* 26. *f.* 8.
Areoda L. *Mac Leay Horæ Ent.* 1. *part* 1. *p.* 158.

HABITAT: New York, and other parts of North America.

Head brownish yellow, being divided in the middle by a transverse suture, the front or fore part being margined, and very plain or even; posterior part shining green or pearl colour, according to the various directions in which it is held. Thorax and scutellum of a changeable brown yellow colour. Between the thorax and the elytra is a row of pale yellow or white hairs. Elytra lemon-coloured, surrounded by a very small, narrow, black margin, and minutely punctured. Abdomen shining green black, covered with a multitude of grey hairs. Legs red brown. Anterior tibiæ broad and thin; being black on the outside, where they are armed with three strong spines or teeth. Intermediate and posterior tibiæ with two spurs. Ungues remarkably bent and long.

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ORYCTES NASICORNIS.

Plate XXXIV. fig. 7. ♂.—8. ♀.

ORDER: Coleoptera. SECTION: Lamellicornes. FAMILY: Dynastidæ.

GENUS. ORYCTES, *Illiger.* Geotrupes, *Fabr.* Scarabæus, *Linn.*

ORYCTES NASICORNIS. Thorace prominentiâ tripliei, capitis cornu recurvo, elytris lævibus. (Long. Corp. 1 unc. 3 lin.)

SYN. Scarabæus Nasicornis, *Linn. Syst. Nat.* 1. 11. *p.* 544. *No.* 15. *Oliv. Ent.* 1. 3. *p.* 37. *No.* 41. *t.* 3. *f.* 39. *a-d.* *Panzer Faun. Ins. G.* 28. *No.* 2. ♂. *Roesel Ins.* II. 1. *p.* 41—65. *n.* 5. *t.* 7. *f.* 8. ♂. *f.* 10. ♀. ♂ *t.* 6, 8 & 9. Larva, Pupa, &c. *Stephens Illustr. Brit. Ent. Mandibulata,* 3. *p.* 216.

HABITAT: Holland, and other parts of Europe.

Male. Head black, with a horn terminating in a point, and bending backwards. Eyes red brown. Thorax brown, almost black, margined and prominent, terminating upwards in three pointed tubercles. Scutellum black, and nearly triangular. Elytra red brown, smooth, shining, slightly margined. The abdomen, legs, and all the under parts of a red brown, and hairy. Tibiæ spined.

Female. Resembles the male in every thing but the head and thorax; having on the former, instead of the horn, a small tubercle, and on the latter a small impression in the place of the pointed knobs.

This insect has been introduced into the list of British species on the authority of the late Mr. Haworth, who recorded the fact of a living specimen having been taken by a bricklayer amongst old timber, on pulling down the roof of a building at Chelsea, (Entom. Trans. vol. i. p. 76.) Mr. Stephens, however, (loc. supra citat.) thinks it very doubtful whether the species be really indigenous, as it appears highly probable that the specimen above alluded to, may have been imported amongst some of the Continental plants which abound in the above vicinity, the insect occurring very copiously in rotten bark, the refuse of conservatories, and putrid wood in various parts of the Continent.

COPRIS SULCATUS.

Plate XXXV. fig. 1.

ORDER: Coleoptera. SECTION: Lamellicornes. FAMILY: Scarabæidæ.

GENUS. COPRIS, *Geoffroy.* Scarabæus, *Linn.*

COPRIS SULCATUS. Ater, capitis tuberculo unico, elytris striatis, thorace anticè lineâ irregulari dorsali impresso. (Long. Corp. 1 unc.)

SYN. Scarabæus Sulcatus, *Drury, App. vol.* 2.
Scarabæus Sulcator, *Oliv. Ins.* 1. 3. 142. 171. *tab.* 26. *f.* 225?
Copris Sulcata, *Fabricius Syst. Eleuth.* 1. *p.* 53. *No.* 104. *Ent. Syst.* 1. *p.* 61. *No.* 200.

HABITAT: Jamaica.

Head broad and thin, hairy underneath; terminating in a short straight horn, inclining backwards, with a small tubercle on each side. Eyes almost surrounded by the thin sides of the head, being placed so as to see both above and below it. Thorax margined, with several protuberances on its front; and on the top with a strong indented line running from the front to the suture of the elytra, where likewise

its margin is interrupted by two smaller impressions, forming an appearance like a square escutcheon. Elytra as long as the thorax, margined, and deeply furrowed, scarcely reaching to the anus. General colour above black or raven grey, but not shining. Thighs very strong, black, and broad. Anterior tibiæ strong, with three teeth and a spine. Tarsi and ungues very small. Middle and hinder tibiæ small at the base, but broad and thick with strong spines at the tips. Scutellum obsolete.

COPRIS CAROLINA.

Plate XXXV. fig. 2.

ORDER Coleoptera. SECTION: Lamellicornes. FAMILY: Scarabæidæ.

GENUS. COPRIS, *Geoffroy*. Scarabæus, *Linn.*

COPRIS CAROLINA. Thorace retuso binodi, capitis cornu erecto brevissimo, clypeo integro, elytris sulcatis. (Long. Corp. circ. 1 unc.)

SYN. Scarabæus Carolinus, *Linn. Syst. Nat.* 1. 11. 545. *No.* 16. *Fabr. Syst. Eleuth.* 1. *p.* 43. *No.* 60. (Copris C.) *Oliv. Ent.* 1. 3. *p.* 134. *No.* 160. *t.* 12. *f.* 113. *De Geer Ins.* 4. *p.* 310. *t.* 18. *f.* 13. *Pal. Beauv. Ins. d'Amer. et d'Afr. Col. pl.* 3. a. *f.* 7.

HABITAT: Maryland, New York.

Head broad and thin, not hairy underneath. Near the front is a thick tubercle (not rising to an horn, as in Fig. I.) projecting forward, being in some specimens (probably females) very small. Thorax margined, lying very high above the head, having protuberances in front, which in some are very faint, and with a small impression on each side near the margin on the lower part. Elytra longer than the thorax, margined and furrowed, (but not so deeply as in Fig. I.), and reaching to the anus. General colour deep black, and shining like pitch, both on the upper and under sides. Thighs very strong, not hairy. The anterior tibiæ strong, with four teeth, and a strong spine to each. The tarsi and ungues very small. The other tibiæ are like those in the preceding figure. Scutellum obsolete.

PHANÆUS CARNIFEX.

Plate XXXV. fig. 3. 4. ♂.—5. ♀.

ORDER: Coleoptera. SECTION: Lamellicornes. FAMILY: Scarabæidæ.

GENUS. PHANÆUS, *Mac Leay*. Copris, *Fabr.* Scarabæus, *Linn.*

PHANÆUS CARNIFEX. Thorace mutico angulato postice igneo-cupreo, capitis cornu longo reflexo, corpore æneo, (Long. Corp. 8—10½ lin.)

SYN. Scarabæus Carnifex, *Linn. Syst. Nat.* 1. 11. *p.* 546. *No.* 22. *Fab. Syst. Eleuth.* 1. 48. 84. *Oliv. Ent.* 1. 3. *p.* 135. *No.* 161. *t.* 6. *f* 46. a. b. *t.* 10. *f.* 86. var. ♀. *Brown Jamaica*, 428. *t.* 43. *f.* 5. *Pal. Beauv. Ins. d'Afr. et d'Amer. Col. pl.* 3. a. *f.* 8. 9. *Mac Leay Horæ Entomol. vol.* 1. Phanæus C.
Scarabæus Pillularius Americanus, *Catesby Carolina*, 3. *p.* 11. *tab.* 11.

HABITAT: New York, Maryland, Virginia, Carolina, &c.

There is no doubt that all these figures belong to one species; though differing, not only in size, but structure. Antennæ light red brown. Head thin, rounded, margined, and of a green golden colour; some (which are evidently males) being furnished with a smooth, round, black horn, almost as long as the thorax, and inclining backwards; others have only a small tubercle in the place of the horn; and others have a small horn, about one-fourth the length of the first mentioned, as in Fig. IV. Thorax

next the head golden green; behind and on the upper part is golden red, and margined, rough and shagreened. In the horned specimens this part terminates on each side the posterior margin in a projecting angle, which is more or less conspicuous, in proportion as the horn is long or short. Those which are quite hornless, as Fig. V., are entirely destitute of these angulated risings, having the thorax rounded, but in its front a small black protuberance or swelling is seen. Elytra golden green, inclining to a blue, and very much channelled, with small striæ placed between others of larger size, extending almost even with the anus. Abdomen black, the sides shining green. Anterior femora and tibiæ black and hairy; the latter very strong and dentated, having a long moveable spine fixed on the inner edge of each, extending somewhat beyond the tarsi, which are very short and small. Intermediate and posterior thighs shining golden green, broad and strong. Tibiæ black, with two spines (one very long) at the tips. Tarsi five-jointed, ungues single, and not divided as most insects have them. Scutellum obsolete.

COPRIS MINUTUS.

Plate XXXV. fig. 6.

ORDER: Coleoptera. SECTION: Lamellicornes. FAMILY: Scarabæidæ, *Mac Leay.*

GENUS. COPRIS, *Geoffroy.* Scarabæus, *Drury.*

COPRIS MINUTUS. Niger, capitis cornu parvo erecto, thorace anticè elevato et tuberculato, elytris striatis. (Long. Corp. 4½ lin.)

SYN. Scarabæus Minutus. *Drury, App. vol.* 2.
Copris Lævis. *Schonh. Syn.* 1. 54. 126. (Nec Lævis, *Drury, tab.* 35. *f.* 7. sec. cit. *Sch.*)

HABITAT: New York.

Entirely black. Head broad and black, extending on each side beyond the eyes, having a small horn on it projecting forwards. Thorax margined, high and prominent, with some small protuberances on its front. Scutellum obsolete. Elytra furrowed, longer than the thorax, and margined; extending beyond the anus. Femora strong and round. Tibiæ small at the base, thickened towards the tips, and armed with spines.

COPROBIUS LÆVIS.

Plate XXXV. fig. 7.

ORDER: Coleoptera. SECTION: Lamellicornes. FAMILY: Scarabæidæ, *Mac Leay.*

GENUS. COPROBIUS, *Latr.* Ateuchus, *Fabr.* Scarabæus p. *Linn.*

COPROBIUS LÆVIS. Niger opacus lævis, clypeo emarginato, thorace postice rotundato, elytrorum lateribus humeralibus haud incisis. (Long. Corp. 9 lin.)

SYN. Scarabæus Lævis, *Drury, App. vol.* 2. (1773.) *Oliv. Ent.* 1. 3. *p.* 160. *No.* 197. *t.* 10. *f.* 89.
Scarabæus Volvens, *Fabr. Ent. Syst.* 1. *p.* 66. *No.* 221. *Syst. Eleuth.* 1. *p.* 60. *No.* 26. (Ateuchus v.)
(Exclus. syn. Scar. pilularius, *Linn.*) *Schon. Syn. Ins.* 1. 1. *p.* 62.

HABITAT: New York, Maryland.

Entirely black, shining like pitch on the under side. Head broad, flattish, and smooth. Thorax margined, smooth, and convex. Scutellum obsolete. Elytra margined, smooth, not reaching to the anus, and rather longer than the thorax. Anterior tibiæ having three teeth on their outer sides, above

which are several very minute ones. Intermediate and posterior thighs and tibiæ smaller than are usually observed among those lamellicorn beetles which have no scutellum.

The advantages resulting from the modern method of investigation adopted in Natural History in general, and especially in Entomology, are no where more conspicuous than in the case of the present species of dung-rolling beetles or *pillularii*, as they were aptly termed by Pliny and other old writers; the present species inhabiting North America, having been long confounded with an inhabitant of Southern Europe, which indeed possesses a similarity in general appearance and habits, but belongs to a distinct genus. Linnæus applied the term pilularius specifically to the species inhabiting Italy and Spain; referring, however, to Catesby's Carolina, pl. 11., so that it is evident that this writer had never seen the North American insect. Schonher however remarks, "scarabæus pillularius Linn. pertinet ad At. volvens Fabr;"* whilst Fabricius, although quoting Drury and De Geer (who both figure the North American species) has increased the confusion by giving Southern Europe as its habitat. Under these circumstances I have done our author the justice to revert to his specific name; his being certainly the earliest systematic specific reference to the American species, which may be distinguished from the European one by the following particulars:—

GENUS. Coprobius, *Latreille.*
(Elytra entire at the sides; intermediate tibiæ with two spurs.)
Coprobius lævis, *Drury.* (Scarab.) volvens, *Fabr.*
HABITAT. North America.

GENUS. Gymnopleurus, *Illiger.*
(Elytra with a deep lateral notch near the shoulders; intermediate tibiæ with one spur.)
Gymnopleurus pilularius, *Linn.* (Scarab.) *Fabr. Oliv.*
HABITAT. Southern Europe.

ONITIS SPINIPES.

Plate XXXV. fig. 8.

ORDER: Coleoptera. SECTION: Lamellicornes. FAMILY: Scarabæidæ, *Mac Leay.*

GENUS. ONITIS, *Fabr.* Scarabæus, *Linn. Drury.*

ONITIS SPINIPES. Exscutellatus niger opacus, capite subcornuto, pedibus intermediis dilatatis et incisis. (Long. Corp. fere 1 unc.)

SYN. Scarabæus Spinipes, *Drury, App. vol.* 2. (1773).
Scarabæus Sphinx, *Fabr. Ent. Syst. p.* 25. *No.* 98. (1775.) *Syst. Eleuth.* 1. *p.* 29. 9. (Onitis Sp.) *Schonh. Syn. Ins.* 1. *p.* 31. 10.

HABITAT: China.

Entirely black. Head margined and rough, having two small protuberances entirely surrounding the eyes. Palpi rather long. Thorax convex, smooth, and margined, being as long as the elytra, and having on each side near the lateral margin a small impression. On the posterior margin next the suture are two more impressions, and a longer one between them. Scutellum obsolete. Elytra furrowed,

* If this had really been the case, the Fabrician name ought surely to have yielded to that of Linnæus.

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and extending to the anus, having a double margin on the sides. Anterior tibiæ as long as the thorax, and remarkable for not having any tarsi, but being bent inwards at their extremities and dentated on their outer sides. Middle femora very broad and flat. Tibiæ short, very narrow, and small at their base, but broad at the tips. Hinder thighs and tibiæ not so broad as the middle ones. Tarsi five-jointed.

DYNASTES CENTAURUS.

Plate XXXVI. fig. 1.

ORDER: Coleoptera. SECTION: Lamellicornes. FAMILY: Dynastidæ, *Mac Leay.*

GENUS. DYNASTES, *Mac Leay.* Geotrupes, *Fabr.* Scarabæus, *Linn. Latr.*

DYNASTES CENTAURUS. Thoracis cornu incurvo basi dentato apice bifido, capitis recurvato unidentato. (Long. Corp. 2 une. 6 lin.)

SYN. Scarabæus Centaurus, *Fabr. Ent. Syst.* 1. *p.* 4. *No.* 5. *Syst. Eleuth.* 1. *p.* 4. *No.* 5. *Oliv. Ent.* 1. 3. *p.* 14. *n.* 9. *t.* 11. *f.* 104. *Jablonsk. Nat. Syst.* 1. 223. *No.* 4. *t.* 2. *f.* 1. *Schon. Syn. Ins.* 1. *p.* 4. *No.* 10.
Scarab. Gideon, *Drury, App. vol.* 2. (Exclus. Syn. *Linn.*)

HABITAT: Sierra Leone (*Drury*). "In India Orientali, Africa" (*Fabricius*).

Head and thorax black; the latter terminating in a horn near an inch and a half long, standing almost erect, but bending forward and diminishing towards the end, which is forked, having a strong spine on each side of the front near the base. The head is furnished with another horn that inclines backwards towards the other, and at the extremity is curled and pointed, having a square knob placed on each side near the curl. Elytra dark brown, almost black, smooth and shining. Tibiæ armed with spines and hairs.

Drury states that this insect was brought from Sierra Leone, and that it lives in the mangrove trees; many specimens having been taken from thence.

TRICHIUS FASCIATUS.

Plate XXXVI. fig. 2.

ORDER: Coleoptera. SECTION: Lamellicornes. FAMILY: Cetoniidæ.

GENUS. TRICHIUS, *Fabricius.* Cetonia p. *Oliv.* Scarabæus, p. *Linn.*

TRICHIUS FASCIATUS. Niger, flavo-rufo-tomentosus, elytris atris fasciis duabus luteis internè confluentibus. (Long. Corp. 7-8 lin.)

SYN. Scarabæus Fasciatus, *Linn. Syst. Nat.* 11. *p.* 556. *Fabricius Ent. Syst.* 1. 119. *Donovan Brit. Ins.* 4. *pl.* 140. *Steph. Illustr. Brit. Ent. Mandibulata,* 3. *p.* 230.
Trichius Succinctus, *Fabr. Ent. Syst.* 11. *p.* 132 (variety).

HABITAT: Germany, France, England.

Head and thorax black, but thickly covered with yellow hairs. The scutellum black and triangular. Elytra tawny yellow, not reaching to the anus; having a black margin, and three large black spots situated on the lateral margin. Abdomen and breast black, and covered with hairs of a very light or pale yellow. Femora and tibiæ black and hairy.

The insect here figured is regarded by most authors as a variety only of the Trichius fasciatus. Fabricius, however, considered it as a distinct species, which he named Trichius succinctus. Dessau also, in the Bulletin des Sciences Naturelles (February 1829), has published some observations, in order to prove the specific distinctness of this and two other species with which it is generally regarded as identical. Its habits are different from those of the other Trichii; being generally found upon flowers, a peculiarity, with which its hirsute body and bee-like appearance apparently offer some indicatorial connexions. It is extremely rare in this country.

DYNASTES TITANUS.

Plate XXXVI. fig. 3. ♂.—4. ♀.

ORDER: Coleoptera. SECTION: Lamellicornes. FAMILY: Dynastidæ, *Mac Leay*.

GENUS. DYNASTES, *Mac Leay*. Geotrupes, *Fabr*. Scarabæus, *Linn*. *Drury*.

DYNASTES TITANUS. Thorace tricorni, intermedio longiori apice bifido, lateralibus subarcuatis acutis, capite mutico. (Long. Corp. cum corn. thorac. 1 unc. 7½ lin.)

SYN. Scarab. Titanus, *Fabr. Ent. Syst.* 1. *p.* 13. *No.* 36. *Syst. El.* 1. *p.* 13. *No.* 39. *Jablonsk. Nat. Syst.* 1. *p.* 282. *t.* 6. *f.* 2. ♂. *Olivier*, 1. 3. *t.* 5. *f.* 38.
Scarabæus Simson, *Drury, App. vol.* 2. (Exclus. Syn. *Linn.*)
Scarabæus major niger tricornis, *Sloane Jamaica, vol.* 2. *t.* 237. *f.* 4. 5.
The Great Brown Sawyer, *Brown's Jamaica, p.* 428. *t.* 43. *f.* 6.

HABITAT: Jamaica.

Male. Head black. Antennæ dark brown. Thorax black, smooth, and shining, and armed with three horns; two of which, being about one-third of an inch in length, are placed on the upper part on each side, lying almost parallel with the body. Beneath these, near the head, rises another from the middle of the thorax, which is a little longer than the two first, bending upwards, and forked at the extremity. Elytra rather rough and furrowed, but shining and black. Tibiæ armed with spines, especially at the extremity, which facilitate the animal in its passage. Abdomen black; anus with a row of light brown hairs.

Female. Differs from the male chiefly in the thorax, which is entirely unarmed. Black and shining, but rather less so than the males; and in the front, just above the head, is a small impression. All the under parts of the insect which in the males are black, in this sex are of a dark reddish brown. In other circumstances it resembles the male.

DYNASTES GIDEON.

Plate XXXVI. fig. 5.

ORDER: Coleoptera. SECTION: Lamellicornes. FAMILY: Dynastidæ, *Mac Leay*.

GENUS. DYNASTES, *Mac Leay*. Geotrupes, *Fabr*. Scarabæus, *Linn*. *Drury*.

DYNASTES GIDEON. Thoracis cornu incurvo maximo apice bifido, capitis recurvato bifido supra unidentato. (Long. Corp. cum corn. 2 unc. 4½ lin.)

SYN. Scarabæus Gideon, *Linn. Syst. Nat.* 1. 11. *p.* 541. *No.* 2. *Swammerdam Book of Nature, t.* 30. *f.* 2. *Fabr. Syst. Eleuth.* 1. *p.* 4. *No.* 3. *Olivier Ent.* 1. 3. *p.* 14. *t.* 11. *f.* 102.
Scarabæus Oromedon, *Drury, App. vol.* 2. *Fabr. Syst. Eleuth.* 1. *p.* 4. *No.* 4. (Var. præcedentis.)

HABITAT: East India.

General colour dark brown, almost black. Thorax smooth and shining, as if polished, and terminating in a strong thick horn, which inclines forward in a curved position, and is forked at the end. From the head also springs another strong horn, forked at the extremity, which in length corresponds with the first; its outer side being broad and round, but its inner side, or that opposite the other horn, is thin and sharp, having a small swelling in the middle. Elytra smooth and shining, with a narrow margin. Anterior tibiæ with four teeth; two being at the tip, and two a little above them. The other tibiæ are furnished with several sharp spines (five or six), chiefly about the tips; which, as noticed in D. Titanus, assist the animal in its passage. Anus not hairy, as in many other species.

CYCLOCEPHALA SIGNATA.

Plate XXXVI. fig. 6.

ORDER: Coleoptera. SECTION: Lamellicornes. FAMILY: Rutelidæ, *Mac Leay*.

GENUS. CYCLOCEPHALA, *Latreille*. Chalepus, *Mac Leay*. Scarabæus, *Drury*.

CYCLOCEPHALA SIGNATA. Glabra, pallidè lutea, thorace lineis duabus, elytris maculis tribus, duabus aut nullis. (Long. Corp. 7-8 lin.)

SYN. Melolontha Signata. *Fabricius Syst. Eleuth.* 11. *p.* 169. *No.* 51. *Oliv. Ent.* 1. 5. *t.* 4. *f.* 33. & 36. *Herbst. Col.* 111. *p.* 79. *f.* 2. 32.

Scarabæus Amazonus? *Drury, App. vol.* 2. *Sloane Hist. Jamaica,* 11. *p.* 206. 8. *t.* 237. *f.* 32. (Exclus. Syn. *Linn.*)

HABITAT: Antigua, New York, Virginia, St. Christopher's.

Entirely dark dirty straw-coloured. Thorax margined, with two oblong black spots on it. Scutellum triangular. Elytra margined, with two small faint brown spots on each. Abdomen and legs hairy, the former extending beyond the ends of the elytra. Anterior tibiæ spinose; the internal spur being remarkably long.

COPROBIUS TRIANGULARIS.

Plate XXXVI. fig. 7.

ORDER: Coleoptera. SECTION: Lamellicornes. FAMILY: Scarabæidæ, *Mac Leay*.

GENUS. COPROBIUS, *Latr.* Scarabæus, *Linn. Drury.* Ateuchus, *Fabr.*

COPROBIUS TRIANGULARIS. Niger; clypeo bidentato, thoracis margine fulvo obtusè angulato, femoribus posticis brunneis. (Long. Corp. fere 6 lin.)

SYN. Scarabæus Triangularis, *Drury, App. vol.* 2. *Fabr. Syst. Ent. p.* 30. *No.* 122. *Syst. Eleuth.* 1. *p.* 63. *No.* 42. *Oliv. Ent.* 1. 3. *p.* 166. *t.* 15. *f.* 139.

HABITAT: Surinam.

Head dirty green. Thorax very convex and broad, dark yellow all round the edge, but black in the middle, and of a coppery hue. Elytra black and margined. Abdomen yellow. Anus black. Thighs yellow. Tibiæ and tarsi black. Scutellum obsolete.

ONTHOPHAGUS SERRATIPES.

Plate XXXVI. fig. 8.

ORDER: Coleoptera. SECTION: Lamellicornes. FAMILY: Scarabæidæ, *Mac Leay.*

GENUS. ONTHOPHAGUS, *Latreille.* Copris, *Fabricius.* Scarabæus, *Drury.*

ONTHOPHAGUS SERRATIPES. Niger, capite lato, abdomine subæneo, elytris striatis luteo marginatis. (Long. Corp. lin. 5.)

SYN. Scarabæus Serratipes, *Drury, App. vol.* 2.

HABITAT: China.

Head and thorax black; the former very broad. Antennæ are black. Abdomen dark green, almost black. Scutellum obsolete. Elytra rather longer than the thorax, furrowed and black, slightly margined; just above which, all round their external edges, they are of a dirty clay colour. Anus the same.

PRIONUS (ORTHOSOMA) PENSYLVANICUS.

Plate XXXVII. fig. 1.

ORDER: Coleoptera. SECTION: Longicornes. FAMILY: Prionidæ, *Leach.*

GENUS. PRIONUS, *Fabr.* Cerambyx, *Linn.* SUBGENUS: Orthosoma, *Serv.*

PRIONUS (ORTHOSOMA) PENSYLVANICUS. Obscurus, thorace marginato tridentato, pectore abdomineque ferrugineis, antennis brevibus. (Long. Corp. 1 unc. 6 lin.)

SYN. Cerambyx Pensylvanicus, *De Geer Mem.* 5. *p.* 99. *t.* 13. *f.* 13.
Cerambyx unicolor, *Drury. App. vol.* 2.
Cerambyx brunneus, *Forster Cent. Ins. p.* 37. *Linn. Syst. N.* (*Gmel.*) 1. iv. 1828.
Cerambyx cylindroides, *Linn. Syst. Nat.* (*Ed. Gmel.*) 1. iv. 1818.
Prionus cylindricus, *Fabr. Sp. Ins.* 1. *p.* 207. 14. *Syst. Eleuth.* 11. *p.* 261. *Oliv. Ent.* iv. 66. *p.* 23. *t.* 1. *f.* 6. *Latr. Gen. Cr.* 111. *p.* 33. *Serv. Ann. Soc. Ent. France,* 1. 156. (Orthosoma c.)

HABITAT: New York.

Head dark chesnut-coloured. Antennæ about two-thirds of the length of the insect. Thorax somewhat darker, rounded, and margined; having three small spines on each side. Scutellum semi-oval. Elytra light chesnut, margined, and flattish; being about three times the length of the thorax and head, and broad at their extremities. Abdomen, thighs, and tibiæ red chesnut, shining as if polished.

PRIONUS (DEROBRACHUS) LATICOLLIS.

Plate XXXVII. fig. 2.

ORDER: Coleoptera. SECTION: Longicornes. FAMILY: Prionidæ, *Leach.*

GENUS. PRIONUS, *Fabr.* Cerambyx, *Linn.* SUBGENUS: Derobrachus, *Serv.*

PRIONUS (DEROBRACHUS) LATICOLLIS. Niger latus, thorace marginato transverso, tridentato, atro nitido; antennis brevibus. (Long. Corp. 1 unc. 9 lin.)

SYN. Cerambyx Laticollis, *Drury, App. vol.* 2.
Prionus brevicornis, *Fabricius Syst. Eleuth.* 2. *p.* 260. 15. *Sch. Syn. Ins.* 3. 339. *Pal. Beauv. Ins. d'Afr. et d'Amer. Col. Pl.* 34. *f.* 3.

HABITAT: New York.

Head black. Antennæ 12-jointed, about half the length of the insect. Thorax black, broad, short, and shining; thick in the middle, but on the sides thin and jagged. Scutellum bell-shaped. Elytra

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rough, black, and margined on the sides and suture; extending in one of the sexes beyond the anus. Abdomen and under parts black and shining. Tibiæ with two short spurs. Tarsi beneath of a dirty clay colour.

STENOCORUS (EBURIA) QUADRIMACULATUS.

Plate XXXVII. fig. 3.

ORDER: Coleoptera. SECTION: Longicornes. FAMILY: Cerambycidæ, *Leach.*

GENUS. STENOCORUS, *Fabr.* Cerambyx p. *Linn.* SUBGENUS: Eburia, *Serville.*

STENOCORUS (EBURIA) 4-MACULATUS. Pallidè luteus, thorace spinoso scabro, elytris bidentatis maculis binis glabris albidis. (Long. Corp. fere 1 unc.)

SYN. Cer. 4-maculatus, *Linn. Syst. Nat.* 1. 2. *p.* 626. 27? *Fabricius Syst. El.* 2. *p.* 398. 16. *Syst. Ent. p.* 180. 11. *Trans. Ent. Soc.* 1. *p.* 83. *Oliv. Ent.* iv. 67. *p.* 45. 58. *t.* 21. *f.* 164. *Sloan. Hist. Jamaica,* 1. *p.* 209. 20. *&* 11. *tab.* 237. *f.* 21. *Serville Ann. Soc. de Franc.* 3, *p.* 9. (Eburia q.)

HABITAT: Jamaica.

Head pale clay-coloured. Antennæ (being the length of the insect) of a redder colour, and at their bases almost surrounded by the eyes. Thorax of the same colour as the head, very cylindrical; having a sharp spine on each side, and two short black ones on the top. Scutellum small, and semi-oval. Elytra pale clay-coloured, having on each two spines at the tip of each, the inner one being the smaller; and having also four oblong yellow spots, two placed at the middle and two at the base. Each of these spots appears to be composed of a large and a small one joined close together; the largest (in the upper spots) being the inner one, and in the lower spots being the outer one. Abdomen and legs of the same colour as the head, &c.; the four posterior femora with two small spines at the tips.

CLYTUS LONGIPES.

Plate XXXVII. fig. 4.

ORDER: Coleoptera. SECTION: Longicornes. FAMILY: Cerambycidæ, *Leach.*

GENUS. CLYTUS, *Fabr.* Cerambyx, *Linnæus.*

CLYTUS LONGIPES. Obscurè rufescens; thoracè cylindrico, elytris pallidè sericeis, lunulis quatuor fascis apiceque dentato. (Long. Corp. fere 1 unc.)

SYN. Cerambyx longipes, *Drury, App. vol.* 2. *Sch. Syn. Ins.* 3. 499. 43.
Cerambyx lunulatus, *Linn. Syst. Nat.* (*Gmel.*) 1. iv. *p.* 1864.

HABITAT: Jamaica.

General colour dark red brown. Antennæ about half the length of the insect. Thorax cylindrical, and covered with a fine short down or hair; having on each side a small tubercle or swelling, without any spine. Scutellum small, and semi-oval. Elytra party-coloured; the lighter parts (as seen in the plate) being covered with the same kind of short hair as the thorax; with four spines at their extremities, the two inner ones being the smallest. Abdomen with three yellow spots on each side, and another at the anus. The body has likewise a large one on each side, and another near the breast, joining to the middle legs. Four hind legs long. Femora rough, with two short spines at the tips. Tibiæ with two spurs.

STENOCORUS (CHLORIDA) FESTIVUS.

Plate XXXVII. fig. 5.

ORDER: Coleoptera. SECTION: Longicornes. FAMILY: Cerambycidæ, *Leach.*

GENUS. STENOCORUS, *Fabr.* Cerambyx p. *Linn.* SUBGENUS. Chlorida, *Serv.*

STENOCORUS (CHLORIDA) FESTIVUS. Thorace utrinque bidentato, elytris bidentatis viridibus lineâ laterali luteâ. (Long. Corp. fere 1 unc.)

SYN. Cerambyx Festivus, *Linn. Syst. Nat.* 1. 11. *p.* 623. 11. *Fabricius Syst. Ent. p.* 179. 4. *Syst. Eleuth.* 11. *p.* 305. 3. *Herbst. Arch. p.* 92. *t.* 25. *f.* 12. *Serville Ann. Soc. Ent. de Franc.* 3. 32. (Chlorida f.)
Cerambyx Sulcatus, *Oliv. Ent.* iv. *p.* 67. *p.* 28. 32. *t.* 16. *f.* 113.
Cerambyx Spinipes, *De Geer Ins.* v. *t.* 13. *f.* 14.

HABITAT: Jamaica.

Head clay-coloured. Antennæ about two-thirds the length of the insect, very dark brown; first articulation clay-coloured. Thorax also clay-coloured; having two spines on each side of it, one larger than the other. Scutellum small, and nearly triangular. Elytra margined at the sides and suture, each with two spines at the extremities, the inner ones being the smallest; green, and deeply furrowed or grooved, having a yellow line running along their lateral margins. Legs, abdomen, and all the under side clay-coloured. Tibiæ armed with two spines at the tips.

STENOCORUS (CERASPHORUS) BALTEATUS.

Plate XXXVII. fig. 6.

ORDER: Coleoptera. SECTION: Longicornes. FAMILY: Cerambycidæ, *Leach.*

GENUS. STENOCORUS, *Fabr.* Cerambyx p. *Linn.* SUBGENUS. Cerasphorus, *Serv.*

STENOCORUS (CERASPHORUS) BALTEATUS. Thorace cylindrico 1-spinoso; elytris-bidentatis griseis maculâ oblongâ obliquâ. (Long. Corp. fere 1 unc.)

SYN. Cerambyx balteatus, *De Geer Ins.* v. *p.* 111. *t.* 14. *f.* 3.
Stenochorus garganicus, *Fabricius Syst. Ent. p.* 178. 3. *Syst. Eleuth.* 11. *p.* 305. 2. *Oliv. Ent.* iv. 67. *t.* 15. *f.* 105. *Pal. Beauv. Ins. d'Afr. et d'Amer. Col. pl.* 37. *f.* 3.
Cerambyx cinctus, *Drury, App. vol.* 2.

HABITAT: Virginia, New York, Maryland, Antigua.

General colour greyish hazle. Antennæ longer than the insect. Thorax cylindrical, with a single short spine on each side. Scutellum triangular, and of a yellowish colour. Elytra margined; having an oblong spot, of a faint yellowish colour, running transversely cross each, near the thorax, with two small spines of equal size at the tip of each. It is covered all over with short hair, or down.

PRIONUS (STENODONTES) DAMICORNIS.

Plate XXXVIII. fig. 1.

ORDER: Coleoptera. SECTION: Longicornes. FAMILY: Prionidæ, *Leach.*

GENUS. PRIONUS, *Geoffroy.* Cerambyx p. *Linn.* SUBGENUS. Stenodontes, *Serv.*

PRIONUS (STENODONTES) DAMICORNIS. Thorace marginato denticulato, mandibulis porrectis bidentatis, elytris brunneis. (Long. Corp. mandib. inclus. 3 unc. 7½ lin.)

SYN. Cerambyx Damicornis, *Linn. Mant.* 1. *p.* 532. *Fabricius Syst. Ent. p.* 162. 10. *Syst. Eleuth.* 11. *p.* 262. 23. (Prionus d.) *De Geer Ins.* v. *p.* 97. 2.
Lucanus fuscus maximus, *Browne Nat. Hist. Jamaica, p.* 429. *t.* 44. *f.* 8. *Sloane Jamaica, vol.* 2. *tab.* 37. *fig.* 6.

HABITAT: Jamaica *(Drury)*. America *(Fabricius)*.

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Head dark brown, almost black, broad, large and rough on the top; mandibles triangular and sharp pointed, bending or inclining towards each other; somewhat longer than the head, and a little hairy within; having a tooth or spine on the inner edge, near the point, and another near the base. Thorax of the same colour as the head; very rough and uneven at top, being margined on the anterior and posterior edges; the sides being thin and serrated. Antennæ, rather shorter than the insect, and placed before the eyes. Scutellum triangular. Elytra brown and margined, not reaching to the anus. Abdomen and legs dark red brown. The tibiæ with three small spurs.

The larva of this beetle is a great fleshy grub, which lives in the stumps of tree. It is eaten by many persons, by whom it is considered a great dainty. The perfect insect is called by the natives the macokko beetle. The following observations, published by Mr. Drury in the introduction to his third volume, will be read with interest from the spirit of practical utility in which they are written.

"The larvæ or caterpillars, not only of this but of all the beetles that feed on decayed wood, seem to be rich and delicate eating, particularly those of the Curculio palmarum (vid. Linn. Syst. Nat. p. 606. 1.), and in general all those of the Cerambyces. So that every forest in the torrid zone affords a man plenty of very wholesome and hearty nourishment, who has an instrument strong enough to cut in pieces the decayed trees. This knowledge might have saved the lives perhaps of many seamen who have been shipwrecked on desert equinoctial shores, which are generally covered with thick woods. Mr. Smeathman has met with many maritime people, who, by living on a scanty allowance of unripe fruits, crude roots, coarse seeds, nuts, and other trash, after a shipwreck, or in other cases of distress so frequent with people in the African trade, have made themselves exceeding sick, and much increased their hardships, which by means of these caterpillars only, might have been greatly alleviated. The very best kind of vegetable food is but poor nourishment for the labouring Europeans, if not accompanied with animal flesh, or at least with animal or vegetable oils; and such foods as seamen in distress meet with, as above mentioned, have oftentimes very acrimonious qualities, and are dangerous even in small quantities to those who eat them at intervals, either out of mere curiosity or to gratify their appetites; while these kinds of insect foods, abounding with a very rich and delicious oil, are consequently the most wholesome and nutritious which men in the situation above described could possibly procure, requiring no other preparation than roasting in any manner. (See Philosophical Transactions.) To this kind of food may be added that of the termites and locusts in general among the insect tribes, which are not only wholesome to all, but palatable to many. At any rate they are sufficient to support life; and the knowledge of such a resource universally extended, might in many instances be the means of saving the lives of adventurers to distant climes. Besides these means of subsistence, if the botanists could point out a plain and obvious method for men in general to distinguish the noxious roots and herbs from those which are edible, men thrown on any thing but mere rocks and sand. banks would readily find subsistence, the kind hand of nature being extended all over the

surface of our globe to every one who will accept the friendly invitation, and use the means she has with such a motherly tenderness offered for our benefit and support.

"Mr. Smeathman has assured me, that in clearing the ground in Africa he has found great quantities of roots of the yam and potatoe kind (Convolvulus Batatas), that grew spontaneously, and which the slaves from distant interior regions knew exceedingly well, and sought for with great avidity. He lived near two years in Africa before he found that the most excellent greens for boiling grew wild in every open glade of the island, and even close to his very door. I mention these things because they are all within the power of men in the most naked, unarmed, and unprepared situation, and require neither fire-arms or other powerful apparatus to obtain them; and shew that in these cases, as well as many others, the study of natural history is of no small importance to mankind, since it may not only promote trade, arts, and sciences, but be conducive to the immediate happiness and safety of men's lives."

PRIONUS (MALLODON) MELANOPUS.

Plate XXXVIII. fig. 2.

ORDER: Coleoptera. SECTION: Longicornes. FAMILY: Prionidæ, *Leach.*

GENUS. PRIONUS, *Geoffroy.* Cerambyx p. *Linn.* SUBGENUS. Mallodon, *Serv.*

PRIONUS (MALLODON) MELANOPUS. Thorace marginato denticulato, mandibulis porrectis multidentatis, elytris ad apicem mucronatis. (Long. Corp. mandib. inclus. 2 unc. 3 lin.)

SYN. Cerambyx Melanopus, *Linn. Syst. Nat.* 1. 11. *p.* 623. 8. *Fabricius Sp. Ins.* 1. *p.* 208. 20. *Syst. Eleuth.* 11. *p.* 264. 34. *Oliv. Ent.* iv. 66. *p.* 18. *t.* 12. *f.* 46. *Merian Ins. Surinam. t.* 24. *f.* 1.
Cerambyx crenulatus, *Drury, App. vol.* 2.

HABITAT: Jamaica (*Drury*). "In America Meridionali" (*Fabr.*).

Head short and black. Mandibles short. Antennæ dark brown, almost black; shorter than the insect. The thorax broad, rough and black, margined on the posterior and anterior edges; having many small sharp spines on its sides, the two last of which are larger than the rest, and having two tubercles on the upper side. Elytra dark brown, almost black, margined on the sides and suture, with a small spine on each, at the extremities, and extending a little beyond the anus. Abdomen smooth and shining, and of a dark brown colour, nearly black. Sides of the breast hairy. Legs dark brown, almost black, smooth and shining, with three small tibial spurs.

PRIONUS (MALLODON) MAXILLOSUS.

Plate XXXVIII. fig. 3.

ORDER: Coleoptera. SECTION: Longicornes. FAMILY: Prionidæ, *Leach.*

GENUS. PRIONUS, *Geoffroy.* Cerambyx p. *Linn.* SUBGENUS. Mallodon, *Serv.*

PRIONUS (MALLODON) MAXILLOSUS. Thorace marginato crenato, mandibulis porrectis intus hirsutis quadridentatis, elytris ad apicem mucronatis. (Long. Corp. fere 2 unc. 3 lin.)

SYN. Cerambyx Maxillosus, *Drury, App. vol.* 2. *Fabricius Syst. Ent. p.* 163. 151. *Syst. Eleuth.* 11. *p.* 264. 31. Prionus m.) *Oliv. Ent.* iv. 66. *p.* 16. *t.* 1. *f.* 3.

HABITAT: Barbuda, near Antigua, "where it was found dead at the foot of a tree." (*Drury*). America (*Fabr.*).

TOLMSON

Head black, broad, and very rough above, with two strong, thick, black triangular mandibles, nearly as long as the thorax; having the inner margin very hairy, and armed with teeth; sharp pointed at the tips, with their points bending towards each other. Antennæ about half the length of the insect; close underneath which on each side is a strong spine. Thorax black, as broad as the elytra; very rough on the sides, but shining in the middle, the surface being very uneven; the anterior angle projecting beyond the edge. Scutellum semi-oval. Elytra dark red brown, shining, and margined deeply on the edges, but faintly along the suture; having a very short and small spine at the extremities, and extending a little beyond the anus. Abdomen red brown, smooth and shining. Legs red brown, and smooth, being furnished with three very small tibial spurs.

CERAMBYX (HAMATICHERUS) HEROS.

Plate XXXIX. fig. 1.

ORDER: Coleoptera. SECTION: Longicornes. FAMILY: Cerambycidæ, *Leach.*

GENUS. CERAMBYX, *Linn.* SUBGENUS. Hamaticherus, *Zeigl.* Cerambyx, *Serv.*

CERAMBYX (HAMATICHERUS) HEROS. Thorace spinoso rugoso, niger, elytris subspinosis piceis, antennis longis. (Long. Corp. 2 unc.)

SYN. Cerambyx Heros, *Fabr. Mant.* 1. *p.* 132. *Syst. Eleuth.* 11. *p.* 270. 21. *Oliv. Ent.* iv. 67. *p.* 12. *t. f.* 1. *Panzer F. I. G.* 82. *pl.* 1.

Cerambyx cerdo (var. major), *Linn. Syst. Nat.* 1. 11. *p.* 629. 39. *Drury, App. vol.* 2.

HABITAT: Italy, Smyrna, Scandaroon, Sicily, Gibraltar (*Drury*). Central and Southern Europe.

Head dirty black. Antennæ black, much longer than the body. Thorax very rough, round, black and shining, having a spine on each side; the fore-part, next the head, appearing as if surrounded by a groove. Scutellum small and triangular. Elytra black and margined, dark brown at the extremities, and narrow, covering the anus; having a small spine on each, and being very rough, and shagreened. Abdomen and legs black. Tibiæ clothed with short brown hair, and terminated by two spines; under side of the tarsi cushioned.

TRACHYDERES SUCCINCTUS.

Plate XXXIX. fig. 2.

ORDER: Coleoptera. SECTION: Longicornes. FAMILY: Cerambycidæ, *Leach.*

GENUS. TRACHYDERES, *Dalm.* (*in Sch. Syn.* 111. *p.* 364.) Cerambyx p. *Linn.*

TRACHYDERES SUCCINCTUS. Thorace bispinoso rugoso, elytris fasciâ flavâ, antennis longioribus compressis. (Long. Corp. 1 unc.)

SYN. Cerambyx succinctus, *Linn. Syst. Nat.* 1. 11. *p.* 627. 32. *Fabr. Syst. Ent. p.* 168. 16. *Syst. Eleuth.* 11. *p.* 274. 20. *Oliv. Ent.* iv. 67. *p.* 20. *t.* 7. *f.* 43. a. b. *De Geer Ins.* v. *t.* 14. *f.* 5.

Cerambyx Zonarius, *Voet. Col. Ed. Panz.* 111. *p.* 20. *t.* 7. *f.* 17.

Quici, *Macgr. Brazil, Lib.* vii. *p.* 25. 4. *Jonston Hist. Nat. Ins. t.* 14.

HABITAT: Surinam (*Drury*). "In America meridionali" (*Fabr.*).

Head dark brown, or dirty black, and very rough. Antennæ longer than the insect, with the two basal joints blueish black; the rest red brown, the extremity of each joint being blueish black. Thorax dark brown, shining, and very rough, with large swelling in the middle; having two short thick tubercles

on each side. Scutellum large and long. Elytra dark brown, margined and shining, rather broad at their extremities, and spineless; having a narrow transverse yellow bar in the middle. Abdomen dark brown. Femora dark brown at the base, black at the tips. Tibiæ and tarsi red brown; the latter cushioned beneath with yellow pile.

LAMIA CAPENSIS.

Plate XXXIX. fig. 3.

ORDER: Coleoptera. SECTION: Longicornes. FAMILY: Lamiidæ.

GENUS. LAMIA, *Fabr.* Cerambyx p. *Linn. Drury.*

LAMIA CAPENSIS. Thorace bispinoso; nigra, elytris fasciis quatuor rufis, antennis mediocribus. (Long. Corp. 1 unc. 4½ lin.)

SYN. Cerambyx Capensis, *Linn. Syst. Nat.* 1. 11. *p.* 628. 36. *Fabricius Syst. Ent. p.* 173. 14. *Syst. Eleuth.* 11. 296. 78. *Oliv. Ent.* iv. 67. *p.* 121. *t.* 8. *f.* 51. a. b.

HABITAT: Cape of Good Hope.

Head black; face vertical. Antennæ black, and about the length of the insect. Thorax black and rugged, with two obtuse spines on each side. Scutellum small, black and triangular. Elytra black, rounded and margined at the sides and suture, extending beyond the anus; being rough next the thorax, with a multitude of small round pustules. Each elytron has four red bars crossing it, placed at equal distances, and inclining toward each other; the two first, next the thorax, almost joining at the suture; the two last separated by a small space. In some specimens there are five of these bars. Abdomen and breast black; the latter having between the middle and hinder feet, two oblong red spots. Legs black. Tarsi cushioned beneath and lighter coloured.

CERAMBYX (CALLICHROMA) AFER.

Plate XXXIX. fig. 4.

ORDER: Coleoptera. SECTION: Longicornes. FAMILY: Cerambycidæ, *Leach.*

GENUS. CERAMBYX, *Linn.* SUBGENUS. Callichroma, *Latr.*

CERAMBYX (CALLICHROMA) AFER. Thorace rotundato spinoso, corpore viridi, sutura elytrorum aurea, antennis pedibusque rufis. (Long. Corp. 10½ lin.)

SYN. Cerambyx afer, *Linn. Mant. p.* 532. *Fabr. Syst. Ent.* 166. 9. *Ent. Syst.* 1. 11. *p.* 252. 4. *Syst. Eleuth.* 11. *p.* 268. 7. (C. *ater*, lapsu calami.) *Sch. Syn.* III. *App. p.* 150.

HABITAT: Sierra Leone and Calabar.

Head golden green. Mouth and palpi dirty orange. Eyes black. Antennæ longer than the insect, orange brown. Thorax round, golden green, with many small lines or waves crossing it; and having on each side an obtuse spine. Scutellum small and triangular, golden green. Elytra margined, extending beyond the anus; and, next the thorax, of a golden green, but becoming less brilliant towards their extremities, where they are spineless, having a yellow narrow line running on each side the suture. Breast and abdomen golden green. Legs dark orange.

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CERAMBYX (CALLICHROMA) VIRENS.

Plate XL. fig. 1.

ORDER: Coleoptera. SECTION: Longicornes. FAMILY: Cerambycidæ, *Leach.*

GENUS. CERAMBYX, *Linn.* SUBGENUS. Callichroma, *Latr. Serv.*

CERAMBYX (CALLICHROMA) VIRENS. Thorace rotundato spinoso, corpore viridi, femoribus rufis, antennis pedibusque nigris. (Long Corp. fere 2 unc.)

SYN. *Linn. Syst. Nat.* 1. 2. *p.* 627. 33. *Fabr. Syst. Ent. p.* 166. 8. *Syst. Eleuth.* 2. *p.* 267. 3. *Oliv. Ins.* 4. 67. *t.* 11. *f.* 78. *t.* 18. *f.* 138? *Browne Nat. Hist. Jamaica, p.* 430. *t.* 43. *f.* 8. *Sloane Hist. Jamaica,* 1. 1. *p.* 208. *t.* 237. *f.* 39. 40.

HABITAT: Jamaica.

Head green and shining. Palpi orange brown. Eyes black. Antennæ black, and twice the length of the body; the last joint very long. Thorax green and round, the upper part transversely rugose, and armed on each side with a spine, before which is a small tubercle. Elytra green, and margined; tapering gradually towards their extremities, where they are narrow and pointed; being covered with an infinite number of very small pustules. Abdomen and breast covered with small short hairs, and appearing of a grayish green colour. Thighs dark red, black at the tips. Tibiæ black, and compressed. Tarsi black beneath, cushioned, and orange-coloured.

PRIONUS (ORTHOMEGAS) CINNAMOMEUS.

Plate XL. fig. 2.

ORDER: Coleoptera. SECTION: Longicornes. FAMILY: Prionidæ, *Leach.*

GENUS. PRIONUS, *Geoffr.* Cerambyx, *Linn.* SUBGENUS. Orthomegas, *Serville.*

PRIONUS (ORTHOMEGAS) CINNAMOMEUS. Thorace marginato denticulato, corpore ferrugineo, elytris ad apicem denticulatis. (Long. Corp. 2 unc. 3 lin.)

SYN. Cerambyx Cinnamomeus, *Linn. Syst. Nat.* 1. 2. *p.* 623. 10. *Fabr. Syst. Eleuth.* 2. *p.* 264. 33. *Syst. Ent. p.* 163. 16. *Merian Ins. Surinam, tab.* 24.
Prionus corticinus, *Oliv. Ent.* 4. 66. *p.* 21. *t.* 9. *f.* 34.

HABITAT: (——? *Drury*). Surinam (*Merian*).

General colour like that of cinnamon. Head covered with hair in front. Eyes black, extending almost round the head, being only separated both above and beneath by a narrow space. Antennæ shorter than the body; flattened towards the tips. Thorax thin on the sides, and margined; having two spines, the posterior largest; and on the top are two round tubercles, covered with very short fine hairs or down. Scutellum small and rounded. Elytra margined deeply on the sides, but more faintly at the suture, extending beyond the anus; having a small spine at their extremities, where they are nearly as broad as at the thorax; clothed with exceeding short fine hairs, as are likewise the abdomen and breast. Tibiæ with two spurs.

LAMIA VERRUCOSA.

Plate XL. fig. 3.

ORDER: Coleoptera. SECTION: Longicornes. FAMILY: Lamiidæ.

GENUS. LAMIA, *Fabr.* Cerambyx, *Linn.*

LAMIA VERRUCOSA. Fusca; thorace griseo lateribus angulatis, disco verrucoso; elytris basi rudè punctatis apice lævibus. (Long. Corp. 1 unc. 4½ lin.)

SYN. Cerambyx verrucosus, *Drury, App. vol.* 2. (nec *Oliv. Ent.* 4. *t.* 20. *f.* 148.)
Lamia verrucata, *Schon. Syn. Ins.* 3. *p.* 396. 189.

HABITAT: Barbadoes.

Head black, inclining downwards. Antennæ greyish or dirty black, as long as the body. Thorax dirty grey; and, next the elytra, encircled with a hairy collar, of a red brown colour; very rough above, with short hairs on it; having a strong thick spine on each side, and underneath covered with short red brown hairs. Scutellum small, triangular, hairy, and red brown. Elytra margined at the sides and suture, not covering the anus; rough on the top and sides next the thorax, with deep punctures; but at the tips smooth and shining. Abdomen, breast, femora, and tibiæ covered with short red brown hairs; the latter with a single spur. Tarsi cushioned, and dirty yellowish coloured beneath.

SAPERDA TRILINEATA.

Plate XLI. fig. 1.

ORDER: Coleoptera. SECTION: Longicornes. FAMILY: Lamiidæ.

GENUS. SAPERDA, *Fabr.* Cerambyx, *Linn.*

SAPERDA TRILINEATA. Grisea seu luteo-rufa, vittis tribus longitudinalibus dentatis albis, antennis longis. (Long. Corp. 1 unc.)

SYN. Cerambyx trilineatus, *Linn. Mant. p.* 532. *Fabr. Sp. Ins.* 1. 226. *Syst. Ent.* 179. 6. (Stenochorus t.)
Saperda vittata, *Fabr. Mant. p.* 231. *Syst. Eleuth.* 2. 322. 30.

HABITAT: Jamaica.

Head dark brown, the top being tawny yellow, the sides striped with white. Antennæ greyish brown, much longer than the insect. Thorax very cylindrical, without spines, yellowish brown, having a white stripe on each side, and another on the top. Scutellum very small, semicircular, white, with a black spot in the middle. Elytra margined from the middle to their extremities, where each terminates in a spine, having a white line running on each side from the thorax to their extremities, internally serrated; another white line (also internally indented) runs along the suture, being parallel with those on the thorax and head. Abdomen greyish, with some tawny yellow hairs on each ring. Breast tawny yellow. Legs greyish brown, (the fore ones in one of the sexes being elongated) without any spines at any of the joints.

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CLYTUS PICTUS.

Plate XLI. fig. 2.

ORDER: Coleoptera. SECTION: Longicornes. FAMILY: Cerambycidæ, *Leach*.

GENUS. CLYTUS, *Fabr*. Cerambyx p. *Linn*. Leptura p. *Drury*.

CLYTUS PICTUS. Thorace rotundato flavo-fasciato, elytris fasciis septem flavis; anticis antrorsum, posticis retrorsum arcuatis. (Long. Corp. fere 9 lin.)

SYN. Leptura picta, *Drury, Append. vol.* 2.
Clytus flexuosus, *Fabr. Syst. El.* 2. 345. 1. *Syst. Ent.* 191. 22. (Callidium f.) *Oliv. Ent.* 4. 70, 34. *t.* 6. *f.* 76.
Leptura Robiniæ, *Forster Cent. Ins, p.* 43.

HABITAT: New York; where they are found upon the Locust tree (*Drury*).

Head black, surrounded by a yellow line; front yellow, with a black spot between the antennæ. Antennæ red brown, Thorax black, cylindrical, and smooth, without spines or risings; being encircled with four yellow rings. Scutellum yellow and oval. Elytra black, with six irregular angulated streaks crossing them at equal distances; and another regular and even yellow line crossing them at the joining of the thorax. Abdomen yellow, with dark brown rings. Breast greyish yellow. Legs light red brown, with a small tibial spur.

STENOCORUS (ELAPHIDION) IRRORATUS.

Plate XLI. fig. 3.

ORDER: Coleoptera. SECTION: Longicornes. FAMILY: Cerambycidæ, *Leach*.

GENUS. STENOCORUS, *Fabr*. Cerambyx p. *Linn*. SUBGENUS. Elaphidion, *Serv*.

STENOCORUS (ELAPHIDION) IRRORATUS. Thorace mutico inæquali, elytris apice bidentatis, albo irroratis, antennis longis aculeatis. (Long. Corp. 9 lin.)

SYN. Ceramb. irroratus, *Linn. Syst. Nat.* 1. 2. *p.* 633. 62. *Oliv. Ent.* 4. 67. *t.* 21. *f.* 193. *Fabricius Syst. Ent. p.* 180. 9. *Syst. Eleuth.* 2. 307. 9. *Serville Ann. Soc. Ent. de Franc.* 1835. *p.* 67. (Elaphidion i.)

HABITAT: Jamaica; residing in the mahogany trees (*Drury*).

Head very dark brown, almost black; front dappled with cream colour. Antennæ dark brown, and about the length of the insect; having spines at each joint, except that next the head. Thorax spineless, brownish black, with white patches on its sides; and, when viewed through a microscope, punctured. Scutellum very small, and nearly triangular. Elytra brownish black, margined at the sides and suture, with whitish patches thereon, punctured; having two spines at the extremity of each. Abdomen and breast black, and covered with short grey hairs like pile. Legs reddish brown, with a small spine at the tip of each of the femora (except the fore ones), and another at the tips of the tibiæ.

STENOCORUS (ELAPHIDION) SPINICORNIS.

Plate XLI. fig. 4.

ORDER: Coleoptera. SECTION: Longicornes. FAMILY: Cerambycidæ, *Leach*.

GENUS. STENOCORUS, *Fabr*. Cerambyx p. *Linn*. SUBGENUS. Elaphidion, *Serv*.

STENOCORNUS (ELAPHIDION) SPINICORNIS. Thorace inermi tuberculato; elytris bidentatis, antennarum articulis bispinosis, corpore luteo-griseo, fusco variegato. (Long. Corp. circ. 10 lin.)

SYN. Cerambyx Spinicornis, *Drury, App. vol.* 2. *Fabr. Syst. Ent. p.* 179. 7. *Syst. Eleuth.* 2. 306, 5. *Oliv. Ent.* 4. 67. *t.* 17. *f.* 130. *Serville loc. cit. sup.* (Elaphidion s.)
Cerambyx insularis, *Linn.* (*Gmel.*) 1. 4. *p.* 1859.

HABITAT: Jamaica.

Head clay-coloured. Antennæ red brown, about as long as the insect, each joint having two spines, except that next the head. Thorax clay-coloured and cylindrical, without spines; having a small red brown streak extending along the middle and down the head. Scutellum triangular. Elytra clay-coloured, with many small red brown streaks crossing them; margined on the sides and suture, each having two spines at its extremity. Abdomen and breast greyish clay-coloured, with a small red brown spot on each side of each of the segments. Legs red brown, having a strong spine at the tip of each of the femora, except the fore ones, and another at the tips of each of the tibiæ.

SAPERDA CARCHARIAS.

Plate XLI. fig. 5.

ORDER: Coleoptera. SECTION: Longicornes. FAMILY: Lamiidæ.

GENUS. SAPERDA, *Fabr.* Cerambyx p. *Linn.*

SAPERDA CARCHARIAS. Griseo-pubescens, nigro-punctata, antennis mediocribus griseo nigroque annulatis. (Long. Corp. 5.-8 lin.)

SYN. Ceramb. Carcharias, *Linn. Syst. Nat.* 1. 2. 631. 52. *Fabricius Syst. Eleuth.* 2. 317. 1. *Oliv. Ent.* 4. 68. *t.* 2. *f.* 22. *Panzer F. I. G.* 69. 1. *Stephens Ill. Brit. Ent. Mand. vol.* 4. 238.

HABITAT: Germany (*Drury*). "In Europæ Sylvis" (*Fabr.*).

Head dark clay-coloured. Antennæ clay-coloured, with black rings, and about the length of the insect. Thorax cylindrical and clay-coloured, without any spines or risings on it. Scutellum nearly square. Elytra dark clay-coloured, and margined along the sides; when viewed through a microscope they appear to be covered with a great number of small black pustules. Abdomen and breast clay-coloured; as are the legs, on each of which is a small spine at the tip of the tibiæ.

This fine insect has, within a few years, been found in considerable abundance in the fenny districts of Cambridge and Huntingdonshire, upon low sallows.

STENOCORUS ATOMARIUS.

Plate XLI. fig. 6.

ORDER: Coleoptera. SECTION: Longicornes. FAMILY: Cerambycidæ, *Leach.*

GENUS. STENOCORUS, *Fabr.* Cerambyx p. *Linn.*

STENOCORUS ATOMARIUS. Nigricans, sericie luteâ indutus; thorace cylindrico nec tuberculato nec spinoso; elytris fusco cinereoque variegatis. (Long. Corp. 8 lin.)

SYN. Cerambyx atomarius, *Drury, App. vol.* 2. (nec *De Geer*, 5. *p.* 65. 4. nec *Fabr. Syst. El.* 2. 287. nec *Oliv.* 4. 67. *t.* 9. 59. d.)

Stenochorus marylandicus? *Fabr. Syst. Ent.* 179. 5. *Syst. Eleuth.* 2. 306. 4. *Oliv. Ent.* 4. 70. *t.* 1. *f.* 5.

HABITAT: New York.

Head brownish black, covered with short yellowish grey pile. Thorax dirty black, covered with yellow grey pile; cylindrical, and without any spines or risings. Antennæ dusky brown; having a spine on each joint, except that next the head, and about the length of the insect. Scutellum very small. Elytra black, mottled with yellow grey; being margined at the sides and suture, and not reaching or covering the anus, each having two spines at the extremity. Abdomen and breast greyish brown, as are the legs, each of which is furnished with a spine at the tip of the tibiæ.

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SCUTELLERA DRURÆI.

Plate XLII. fig. 1. 5.

ORDER: Hemiptera. SUBORDER: Heteroptera. SECTION: Geocorisa. FAMILY: Scutati, *Burmeister*.

GENUS. SCUTELLERA, *Latreille, Burmeister*. Tetyra, *Fabr.* Cimex. *Linn.*

SCUTELLERA DRURÆI. Supra rufa, capite, pronoti maculis duabus, scutelli fasciis duabus irregularibus maculisque duabus subapicalibus nigris. (Long. Corp. 7¼ lin.)

SYN. Cimex Drurei, *Linn. Mant.* 534. *Fabr. Ent. Syst.* 4. 83. 33. *Syst. Rhyng.* 132. 17. (Tetyra D.) *Sulzer Hist. Ins. t.* 10. *f.* 5.

HABITAT: China *(Drury)*. America *(Fabricius*, incorrectly).

Head black and small. Antennæ rather longer than the thorax, black, 5-jointed, the two basal joints being shortest. Thorax convex, and slightly margined at the sides; of a fine scarlet colour, with two black spots thereon; somewhat oval, but the outline forming with the head an obtuse angle, the points on the sides being cut off. Wings defended by a thick scaly scutellum, which is very convex and smooth, without any suture, entirely covering the abdomen and extending to the anus, of a scarlet colour, with two broad, black, indented and irregular bars crossing it; one next the thorax which is broadest, and on which are two small scarlet spots; the other placed just below the middle, and seeming to be composed of four spots united together; beneath this are two small black spots, nearly round, situated near the anus. Fig. *a.* represents one of the hemelytra, which when at rest are concealed beneath the scutellum, having the basal portion or corium strong, thick, and opake; and the terminal portion beyond the transverse rib membranaceous. The wing at *b.* is very thin and membranaceous; being more transparent than the hemelytra. Abdomen scarlet, with an oblong black spot at the anus, and four others on each side joining to the edge. The breast appears in a strong light of a deep mazarine blue, almost black. Legs, the same. The proboscis is also blue, lying close to the breast, and extending to the beginning of the abdomen.

GALERITA AMERICANA.

Plate XLII. fig. 2.

ORDER: Coleoptera. SECTION: Adephaga. FAMILY: Carabidæ. SUBFAMILY: Brachinides.

GENUS. GALERITA, *Fabricius*. Carabus *p. Linn. &c.*

GALERITA AMERICANA. Nigra, thorace antennis pedibusque ferrugineis, elytris cyaneis. (Long. Corp. 9 lin.)

SYN. Carabus Americanus, *Linn. Syst. Nat.* 1. 11. *p.* 671. *No.* 19. *De Geer Ins.* iv. *t.* 17. *f.* 21. *Fabricius Syst. Eleuth.* i. 214. 1. (Galerita a.) *Olivier Ent.* iii. 35. *n.* 77. *t.* 6. *f.* 72.
Carabus Janus, *Fabr. Ent. Syst.* 1. *p.* 136. *No.* 51.
Carabus bicolor, *Drury, App. vol.* 2. *De Jean Spec. General*, 1. *p.* 187. 1.

HABITAT: Virginia *(Drury)*. North America.

Head very long, black, with a red brown spot on the middle. Antennæ dark brown, the basal joint being longest, thickest, and lightest coloured; the others are nearly of equal length; the whole being a little longer than the elytra. Neck distinct and black. Thorax light red brown, and almost oval, about the length of the head, and a little broader; it is also a little margined, and next the body truncate. Scutellum minute, black, and triangular. Elytra black, margined and furrowed, oval next the thorax, but more square at their extremities, and not covering the anus. Abdomen black. Breast light red brown; as are all the legs. The basal joint of the posterior tarsi is very long.

BRENTHUS MINUTUS.

Plate XLII. fig. 3. natural size, and 7. magnified.

ORDER: Coleoptera. SECTION: Rhyncophora. FAMILY: Curculionidæ. SUBFAMILY: Brenthides, *Schonh.*

GENUS. BRENTHUS, *Illiger.* Brentus, *Fabr.* Curculio p. *Linn.*

BRENTHUS MINUTUS. Niger, elytris striatis nigro-brunneis. (Long. Corp. fere 6 lin.)

SYN. Curculio minutus, *Drury, App. vol.* 2. *Herbst. Col.* 7. 200. *t.* 108. *f.* 9. B. (Brentus m.) *Schonh. Sys. Ins. Curcul.* 1. 368. 6.

HABITAT: Virginia.

Head black, with a long, horny, slender beak. Antennæ placed near the head, near the base of the beak, black, and about the length of the thorax, the first and last joints being the longest. Thorax black, smooth, and shining; being almost the length of the body, and nearly round, but thickest towards the middle. Scutellum indistinct. Elytra dark brown, with some patches on them of a lighter colour; margined on the sides and suture, and with rows of small punctures thereon. Abdomen dark brown, smooth and shining. The fore legs are longer than the rest, and at the tips of the tibiæ are furnished with a spine. All the thighs are very thick in the middle.

CASNONIA LONGICOLLIS.

Plate XLII. fig. 4. natural size, and 6. magnified.

ORDER: Coleoptera. SECTION: Adephaga-Geodephaga. FAMILY: Carabidæ. SUBFAMILY: Brachinides.

GENUS. CASNONIA, *Latrielle.* Attelabus p. *Linn. Drury.*

CASNONIA LONGICOLLIS. Nigra, elytris punctato striatis, singulo tuberculo parvo subapicali luteo; thorace fere longitudine elytrorum, pedibus luteo nigroque variis. (Long. Corp. 4½ lin.)

SYN. Attelabus longicollis, *Drury, App. vol.* 2.

HABITAT: Virginia.

Head black, long and broad over the eyes, but narrow next the thorax. Antennæ dark brown, about the length of the head and thorax. Thorax nearly the length of the wing-cases, black, slender and shining, rising a little circularly from the body. Scutellum wanting. The elytra are margined and shining, not covering the anus, with rows of very small punctures on them, and near their extremities have a small papilla or swelling of a yellow colour. Abdomen black. Legs partly yellow, and partly black.

XYLOCOPA VIRGINICA.

Plate XLIII. fig. 1.

ORDER: Hymenoptera. SECTION: Mellifera. FAMILY: Apidæ, *Leach.*

GENUS. XYLOCOPA, *Fabr.* Apis, *Linn. Drury.*

XYLOCOPA VIRGINICA. Hirsuta pallida; abdomine, excepto primo segmento, atro. (Magn. Bomb. terrestr.)

SYN. Apis Virginica, *Linn. Mant. p.* 540. *Fabr. Syst. Piez.* 346. 14. (Bombus v.) *Ent. Syst.* 2. 318. 15

HABITAT: Virginia.

Head, between the eyes, black, with a cream-coloured spot in front, just above the mouth. Antennæ black, and shorter than the thorax, which is covered at top with hairs of a pale yellowish colour. All the four wings are membranaceous and transparent. Abdomen composed of six rings,

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entirely black, except the first, which is pale yellow above, but black underneath. The breast and legs are black and hairy, the hairs on the fore legs being rather dark brown. The under parts of all the tarsi are light brown.

TESSERATOMA PAPILLOSA.

Plate XLIII. fig. 2.

ORDER: Hemiptera. SUBORDER: Heteroptera. SECTION: Geocorisa. FAMILY: Scutati, *Burmeister*. (Longilabres, *Latr.*)

GENUS. TESSERATOMA, *St. Farg. & Serv. in Enc. Méth. Latr. Lap. Burm.*

TESSERATOMA PAPILLOSA. Lutea, thoracis lateribus subrotundatis, antennis fuscis basi subferrugineis, abdomine supra purpureo-ferruginoso subtus luteo. (Long. Corp. 1 unc.)

SYN. Cimex Papillosus, *Drury, App. vol.* 2. (nec *Fabr. Burmeist. Saint Farg. & Serv. &c.*)
Tesseratoma Sonneratii. *St. Farg. & Serv. Enc. Méth.* 10. 590. *Guérin Icon. R. An. Ins. pl.* 55. *f.* 4.
Cimex Chinensis, *Thunb. Nov. Ins.* 15. *t.* 11. *f.* 59. *Laporte Class. Hemipt. p.* 60.
Cimex papillosus? *Donovan Ins. India, pl.* 13. *fig.* 2.

HABITAT: China (*Drury*).

Head small, yellowish olive-coloured. Antennæ black. Thorax yellow olive, lying high above the level of the head, and projecting at the ligature of the wings. Scutellum triangular, terminating in a point near the middle of the abdomen; the basal part lying underneath the thorax. Hemelytra crossing each other when at rest; with the basal portion opake, and yellow olive-coloured; the apical membrane being almost transparent. Wings entirely membranaceous, and yellow brown. Abdomen above, dark red, but underneath clay-coloured; furnished with a sharp tooth at each of its segments. Anus terminating in two angular points, with a small spine on each side. Breast pale clay colour; having a black spot directly under the fore legs, and another on each side the middle ones. Legs brown yellow colour. Proboscis brown.

This very common Chinese insect has been confounded by Fabricius, &c. with an African species (Tesseratoma confusa Westw.) and by Saint Fargeau and Serville, with another from Java (Tesseratoma Javana, Klug. Burm. 2. 350. figured by Stoll. t. 1. fig. 2.) As, however, Drury's specific name, as applied to the Chinese species, has the priority in point of date, I have here reverted to it, and would apply a new specific name to the species from Sierra Leone. The Fabrician species belongs to a different section of the genus having the terminal joint of the antennæ elongated. The only specimens which I have seen of it are those contained in the Banksian Collection in the possession of the Linnæan Society of London. Wolff figures the Chinese species. I have little doubt that Donovan's figure is intended to represent the true papillosus, although it is given as an inhabitant of India.

LEPTOSCELIS BALTEATUS.

Plate XLIII. fig. 3.

ORDER: Hemiptera. SUBORDER: Heteroptera. SECTION: Geocorisa, *Latr.* FAMILY: Coreidæ, *Leach.* (Anisoscelites, *Laporte.*)

GENUS. LEPTOSCELIS, *Laporte.* Anisoscelis p. *Burm.* Lygæus p. *Fabr.*

LEPTOSCELIS BALTEATUS. Thorace subspinoso; ferrugineus, elytris lineâ transversâ flavâ, femoribus posticis gracilibus spinulosis. (Long. Corp. 6½ lin.)

SYN. Cimex balteatus, *Linn. Mant.* 534. *Fabr. Ent. Syst.* 4. 142. 27. *Syst. Rh.* 213. 39. (Lygæus b.)

HABITAT: Jamaica.

Head small and slender, red brown, striped with black. Eyes projecting. Antennæ dark brown, or russet colour, and almost the length of the insect. Thorax red brown, with two small yellow spots in front; lying above the level of the head, and terminating at the side in right angles. Scutellum small and angular. Hemelytra coriaceous half way down, and with the basal portion brown red; the apical membrane opake and dark brown; having a yellow bar crossing them near the middle. Wings transparent. Abdomen, above, yellow, and edged with dark brown, the sides being entire; underneath, entirely dark clay-coloured. Proboscis extending to the abdomen along the breast, and lying between the legs.

CENTRIS SURINAMENSIS.

Plate XLIII. fig. 4.

ORDER: Hymenoptera. SECTION: Mellifera. FAMILY: Apidæ, *Leach.*

GENUS. CENTRIS, *Fabr.* Apis, *Drury.*

CENTRIS SURINAMENSIS. Hirsuta nigra; abdomine, excepto primo segmento, flavo. (Mag. Xylocop. virginicâ minor.)

SYN. Apis Surinamensis, *Linn. Syst. Nat.* 1. 2. 961. 52. *Fabr. Ent. Syst.* 2. 318. 14. *Syst. Piez.* 355. 3. (Centris S.)

HABITAT: Surinam.

Head black. Antennæ black. Tongue very long, extending to the middle of the abdomen. Thorax black and hairy. Wings transparent. Abdomen deep yellow, except the basal segment which is black. Breast and legs black, and covered with short hairs like pile. Hind legs very broad and thin, resembling scales; and at the tip of the tibiæ furnished with two sharp spurs; intermediate tibiæ also with two shorter spurs.

OPHION MACRURUM.

Plate XLIII. fig. 5.

ORDER: Hymenoptera. SECTION: Pupivora. FAMILY: Ichneumonidæ, *Leach.*

GENUS. OPHION, *Fabr.* Ichneumon, *Drury.*

OPHION MACRURUM. Fusco-luteum; alis hyalinis, abdomine thorace triplo longiori ensato. (Long. Corp. 1 unc. 3 lin.)

SYN. Ichneumon Macrurus, *Linn. Mant. p.* 540. *Drury, Append. vol.* 2.

HABITAT: New York.

Head small, dark orange-coloured. Eyes large, black, and oblong. Ocelli shining brown. Antennæ nearly the length of the insect, brown orange, and resembling threads. All the other parts of the insect are of the same brown orange, except the wings, which are transparent. Thorax short. Abdomen three times as long as the thorax, very small at the base, like a thread, but increasing in depth (not in thickness) to the extremity, where it appears square and even as if obliquely cut off; arched from the base to the tip. Legs slender, the hinder ones being the longest. Tips of the tibiæ with two long spines, those of the fore legs having only one.

This insect very closely resembles the common English species Ichneumon luteus, Linn. It is, however, considerably larger.

After describing this insect our author took occasion to enter into the natural history of the family to which it belongs, namely, the Ichneumonidæ, so named from the Linnæan genus Ichneumon, which last he says, "appears to be taken from its nature and way of life." He then proceeds as follows:—

"It is generally known that butterflies are produced from caterpillars, and that these caterpillars put on different forms before they arrive to that of the butterfly; but few persons know, who have not engaged in this study, that the bodies of these caterpillars are receptacles or habitations for lesser insects, that live and grow within them during a certain time; where they are nourished and fed by the juices of their bowels, till they arrive to a mature age; when, by the appointment of nature, they kill their fosterers, being totally unable to live on any other kind of food but what the intestines of these animals supply them with. The uses and advantages accruing to mankind by the institution of such a genus of insects, together with their natural history, are the subject of the following lines.

"If we examine the glorious works of the creation, and reflect on the paternal care and wisdom of the Almighty, displayed in the preservation and increase of all ranks and kinds of animals; that even the most direful and noxious, have such a proportion in the scale of life, as is most agreeable to the ends of His divine providence; that the limits He hath prescribed to each, extend so far and no farther; and that each species shall multiply in such abundance or scarcity, as are best adapted to preserve, by a just equilibrium, the harmony of the universe: When, I say, we behold this, the mind can scarcely forbear crying out, under a rapturous sense of conviction, "every thing is good." It is to this end we see the strong are permitted to prey on the weak; and that the number of the latter increase in a proportion sufficient to supply the wants of the former; it is to this end we see some feed on herbs and plants, some on fruits and seeds, and some on flesh; each being furnished with appetites and powers, suited to their respective ways of life: and it is to this end, we see those of the most minute kinds, abounding in a degree far beyond those of the first magnitude. The knowledge of the insect kingdom illustrates this observation beyond all possibility of doubt; and the number that may be bred from a single pair, in many species, would exceed all credibility, if it was not to be proved by any person who

would take the trouble. The wonderful increase that only two summers would be capable of producing among many of them, if each egg was to yield its respective insect, is amazing. The world itself, in a few years, would be incapable of affording plants sufficient for the nourishment of one single species.*

"Hence will appear the 'loving kindness' of the Almighty, in setting such bounds, and keeping them within such limits as best answers the purpose for which He created them; and hence appears the necessity of their becoming food to other animals. Birds, fishes, and the smaller kinds of beasts, are at eternal war with them; but as all these would be insufficient of themselves to restrain and prevent them from multiplying too fast, other kinds of beings are instituted for this end, whose existence depends on their destruction. Of these, the species of insect I am describing, is the most singular, of which (genus) there are several sorts, differing greatly in size and shape. Some are furnished with three setæ or bristles at the extremity of their bodies, the middle one being a hollow tube, secured or fenced by the outer ones, through which they eject their eggs, after they have penetrated the body of the caterpillar they settle on. Some appear to have no bristles, others have them bent close under their bodies, and are not to be seen, unless closely examined. As their whole business appears to be the destroying the caterpillars of the butterfly and moth tribes, they are indefatigable in the pursuit of them; but as this is confined to the pregnant females, they are observed ranging about continually in search of the proper subjects to lay their eggs on; flying on every bush, and running with unwearied diligence on every twig, till they have arrived to the place where the scent of the caterpillar soon furnishes them with the certainty of its being there. Having thus discovered the animal it was in quest of, the Ichneumon immediately settles on it, with an intent to discharge its eggs; but the caterpillar being sensible, from a natural instinct, of its enemy's assault, bends its head backwards to the place where it feels itself attacked, and endeavours by various means, either by striking its head violently against the part, falling to the ground, or by some sudden contortion, to disengage itself: but this seldom happens, unless the Ichneumon is feeble, and unable to withstand the shocks of the caterpillar; in which case they will frequently relinquish their attack, and seek out some other subject, whose resistance they are more capable of encountering. On the other hand, if the Ichneumon is strong enough to withstand the efforts of the caterpillar, it either lays its eggs on the outside of the skin, as is the nature of some to do, or else perforates the body with the bristle before described, and immediately discharges an egg. Some of these Ichneumons quit the caterpillar upon the emission of an egg, but others con-

* "Let no one that is unacquainted with this study, suppose that there is any exaggeration in this account; or that what I have related, is done with a view to catch the opinion of the public. Far from it. Every adept knows it, and to every adept I would appeal.

"I have counted above three hundred eggs, contained in the bag of a spider; and I have observed more than that number laid by a water insect (Phryganea) on a blade of grass, by a river side. The moth, common in our gardens, named the *Great Tiger* (or Caja of Linnæus), lays above six hundred eggs; and almost double that number I have known discharged by a *Long Legs*, as it is called, or Tipula of Linnæus. Goedartius mentions two thousand worms that he plainly counted, springing from their parent insect, and imagines there were three thousand bred from the same animal.

tinue thereon till they have emitted them all; which sometimes is more than an hundred. It is necessary to observe, that many caterpillars of moths and butterflies (the former more especially) are infested by a particular species of these Ichneumons, that confine themselves entirely to them alone, and never, that we know of, attack any other. Thus that of the Privet Hawk or Sphinx Ligustri of Linnæus, that of the Elephant Hawk or Sphinx Elpenor of the same author, &c. are always found to yield particular kinds of Ichneumons. Others, indeed, attack any kind of caterpillar belonging to the farinaceous-winged tribe; and, as I observed above, if not too powerful and strong for them, will there deposit their eggs.

"If the egg is laid on the body of the caterpillar, and not within it, a few days, by the warmth of the sun, ripens it to maturity; and then the young destroyer, directed by nature, eats its passage through the under-side of the egg, and passes into the body of the caterpillar, but if the egg is discharged into its body, it there ripens, unseen, to maturity. In either case, it lives on the substance or juices of its intestines; thriving and increasing in bulk, in a proportion equal to the creature it is doomed to kill. The caterpillar, also, notwithstanding its having thus received the means of a slow but certain death, increases in size, and, to outward appearance, in health; arriving to the period when it is to undergo its metamorphosis, and become a Chrysalis, in as much strength and vigour as any other of the species: but when the time arrives for its enlargement into its complete state, and to become a moth or butterfly, the Ichneumon makes its appearance; having arrived to its time of completion within the body of its supporter, and exhausted its juices by the nourishment drawn from it, leaving behind it a dry empty shell, in the form of a chrysalis.

"In this manner many of these Ichneumons exist. Others, when arrived to maturity, having lived within the bodies of the caterpillars, as described, eat their way out through its sides, and, crawling to a small distance, form round themselves cases of a substance like silk; wherein, having lain a few days, they quit their prisons in the shape of very small flies, some having two wings, others four."—Vide Goedartius, Albin, Wilks, Harris, &c.

POLISTES ANNULARIS.

Plate XLIII. fig. 6.

ORDER: Hymenoptera. SECTION: Diploptera. FAMILY: Vespidæ, *Leach.*

GENUS. POLISTES, *Fabr.* Vespa, *Linn. Drury.*

POLISTES ANNULARIS. Fusca; genubus, antennarum apicibus margineque primi segmenti abdominis flavis. (Long. Corp. 1 unc.)

SYN. Vespa annularis, *Linn. Syst. Nat.* i. 2. 950. 9. *Fabr. Syst. Piez.* 271. 3. (Polistes a.)
Vespa cincta, *Drury, App. vol.* 2.

HABITAT: Virginia (*Drury*).

Head dark brown colour, like the rust of iron. Antennæ shorter than the thorax; dark brown, yellow at the tips. Thorax dark brown, with a black stripe on each side. Wings extending beyond the abdomen, thin, membranaceous, and dark brown, not perfectly transparent, and doubled or folded

lengthways together. Abdomen black, except the first segment, which is dark orange, margined with yellow. Anterior femora dark brown, the other parts of those legs yellow. The other legs dark brown; the tips of the tibiæ and the tarsi being yellow.

POLISTES SQUAMOSA.

Plate XLIII. fig. 7.

ORDER: Hymenoptera. SECTION: Diploptera. FAMILY: Vespidæ, *Leach.*

GENUS. POLISTES, *Fabr.* Vespa, *Linn. Drury.*

POLISTES SQUAMOSA. Thoracis dorso nigro lineis flavis, scutello flavo lineâ nigrâ, abdomine fulvo annulo nigro versus apicem. (Long. Corp. 10 lin.)

SYN. Vespa Squamosus, *Drury, App. vol.* 2.
Polistes lineata? *Fabr. Syst. Piez.* 271. 9. *Ent. Syst.* 2. 259. 20.

HABITAT: New York.

Head yellow; but on the top, near the ocelli, black and hairy. Antennæ shorter than the thorax, dark brown, yellow next the head to the first joint, including about a third part. Thorax yellow, slightly hairy; having three black stripes on the top and two on each side meeting on the breast. Wings thin, almost transparent, and doubled or folded longitudinally. Abdomen dark orange, with a black ring next the anus, and two lesser ones near the thorax; none of which are seen underneath, being there entirely of a dark orange. Legs yellow, and furnished with two spines at the tips of the tibiæ; the anterior having only one.

POLYDESMUS (FONTARIA) VIRGINIENSIS.

Plate XLIII. fig. 8.

ORDER: Chilognatha, *Latreille.* Aptera, *Linnæus, Drury.* FAMILY: Julidæ.

GENUS. POLYDESMUS, *Latreille, Brandt in Bull. Soc. Nat. Mosc. vol.* 6. Julus, *Fabr.* Fontaria, *J. E. Gray.*

POLYDESMUS (FONTARIA) VIRGINIENSIS. Corpore pallide griseo, segmentis convexis, articulo pedum secundo acutissimo. (Long. Corp. 1 unc. 6 lin.)

SYN. Julus virginiensis, *Drury, App. vol.* 2. *Pal. Beauv. Ins. d'Afr. et d'Amer. Apter. pl.* 4. *f.* 5. *p.* 156.
Julus tridentatus, *Fabr.*
Fontaria Virginiensis, *J. E. Gray in Griff. An. K. Ins. pl.* 135. *f.* 1.

HABITAT: Virginia.

This insect is entirely wingless. Head circular and flat, placed under the first segment. Antennæ composed of five equal articulations. Body rounded at top, forming an arch equal to one-fourth of a circle, and consisting of nineteen rings or scales, which lie very closely over one another, the hinder part of one exactly fitting the fore part of the next. Each of these scales, except some near the head, have four short feet fixed to them; the whole number of which is sixty. The general colour of the insect is whitish grey; the under part being lighter than the upper. Along the middle of the latter runs a darker shade, having a single spot of a wainscot colour placed on the middle of each scale.

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MYDAS CLAVATUS.

Plate XLIV. fig. 1.

ORDER: Diptera. SECTION: Notacantha, *Latr.* FAMILY: Mydasidæ, *Leach.*

GENUS. MYDAS, *Fabr. Latr.* Midas, *Weidemann.* Musca, *Drury, De Geer.*

MYDAS CLAVATUS. Niger, abdominis segmento secundo aurantiaco, alis nigris. (Long. Corp. 1 unc. 3 lin.)

SYN. Musca clavata, *Drury, App. vol.* 2. (1778.)
Bibio filata, *Fabr. Mant. Ins.* 2. 328. 1. (1787.) *Syst. Antl.* 60. 1. (Mydas f.) *Weidemann Aussereur. Zweifl. Ins.* 1. 240. 3. *tab.* 11. *fig.* 3. *Ditto in Nova Acta Nat. Curios. vol.* 5. *p.* 2. *pl.* 53. *fig.* 8.
Nemotelus asiloides, *De Geer Mem. vol.* 6. *t.* 29. *f.* 6.

HABITAT: New York, and other parts of North America.

Head black. Antennæ nearly the length of the thorax, black, slender, and knobbed at their extremities. Thorax black and smooth. Wings coppery brown, very membranaceous, and not transparent. Abdomen black, and composed of eight segments, the second being of a deep yellow; which colour extends only to its sides, the under part being black. Legs entirely black; the hinder ones being furnished with a strong spine at the tips of the tibiæ, the middle ones having four small ones, and the fore ones none. Each of the ungues has two small yellow scales (puvilli) placed underneath.

TABANUS PLUMBEUS.

Plate XLIV. fig. 2.

ORDER: Diptera. SECTION: Tabaniens, *Latr.* FAMILY: Tabanidæ, *Leach.*

GENUS. TABANUS, *Linn, &c.*

TABANUS PLUMBEUS. Obscurè coccinelleus, abdomine marginibus posticis pallidioribus, alis sublimpidis costâ fuscâ, antennis brunneo-rufis. (Long. Corp. 1 unc.)

SYN. Tabanus plumbeus, *Drury, App. vol.* 2.
Tabanus ruficornis, *Fabr. Syst. Ent.* 789. 8. *Syst. Antl.* 96. 14. *Weidemann Auss. Zw. Ins.* 1. 112.
Tabanus Americanus, *Forster Novæ Sp. Insect. Cent.* 1. 100.
Tabanus limbatus, *Pal. Beauvois Ins. d'Afr. & d'Amer. Dipt. t.* 1. *f.* 2.

HABITAT: New York, Virginia, &c. North America.

Head ash-coloured. Eyes nearly black. Antennæ red brown. Only one ocellus, placed a little above the antennæ. Proboscis almost equal in length to the depth of the head. Thorax dark greenish-brown coloured; having a white spot at the base of each wing. Abdomen dark brown colour; each segment being on the under side margined with grey. Wings transparent; anterior edges brown and opake. Legs dark brown; the middle ones having two spines at the tips of each of the tibiæ. The ungues have two small brown scales under them. Breast hairy and ash-coloured, but white on the sides.

TABANUS AMERICANUS.

Plate XLV. fig. 3.

ORDER: Diptera. SECTION: Tabaniens. FAMILY: Tabanidæ.

GENUS. TABANUS, *Linn. &c.*

TABANUS AMERICANUS. Niger, abdomine canescente, alis fusco-nigris. (Long. Corp. circ. 11 lin.)

SYN. Tabanus Americanus, *Drury, App. vol.* 2. (nec *Forster.*)
Tabanus atratus, *Fabr. Syst. Ent.* 789. 9. *Syst. Antl.* 96. 16. *Weidemann Auss. Zw. Ins.* 1. 114. *No.* 3.
Tabanus niger, *Pal. Beauv. Ins. Afr. et Amer. Dipt. t.* 1. *f.* 1.

HABITAT: New York, and other parts of North America.

Head black. Antennæ black, being placed on the front of the head; the parts surrounding them shining, as if finely polished. Ocelli wanting. Proboscis red brown; being inclosed in a kind of sheath, which is black. Thorax very dark brown, almost black. Wings dark brown and membranaceous, not transparent. Abdomen lead coloured, the extremity nearly black; being of the same colour underneath as at top. Legs entirely black; the middle ones being furnished with two spines at the tips of the tibiæ. Breast hairy and black.

SPHEX JAMAICENSIS.

Plate XLIV. fig. 4.

ORDER: Hymenoptera. SECTION: Fossores. FAMILY: Sphegidæ, *Leach.*

GENUS. SPHEX, *Linn. &c.*

SPHEX JAMAICENSIS. Castaneo-rufus, abdomine nitido, capite thoraceque fulvo-hirtis, antennis nigris, alis fuscis.

SYN. Vespa Jamaicensis, *Drury, App. vol.* 2.

HABITAT: Jamaica.

Head brown orange. Antennæ almost black, and near the length of the thorax. Eyes large, and dark brown. Thorax brown orange-coloured, and hairy, with a black spot between the wings. Wings nearly transparent, *and doubled or folded together.* Abdomen shining and very smooth, red brown, and united to the thorax by a small but short thread-like peduncle. Legs red brown, and, except the fore ones, furnished with three spines at the tips of the tibiæ.

Drury described this insect as having the wings doubled or folded together, a peculiarity observed only in the wasps, amongst which the insect was placed by our author, who named it *Vespa* Jamaicensis. My specimen of this insect, which I have reason to believe belonged to Drury, is so pinned, that the upper surface of the thorax is pressed down, and the upper wing forced backwards, and thrown nearly upside down, which was evidently the case with the specimen described by Drury.

SCOLIA FOSSULANA.

Plate XLIV. fig. 5.

ORDER: Hymenoptera. SECTION: Fossores. FAMILY: Scoliidæ.

GENUS. SCOLIA, *Fabr.* Sphex, *Drury.*

SCOLIA FOSSULANA. Atra, thorace flavido hirto, abdomine fasciis quatuor flavis, intermediis dentatis. (Long. Corp. 1 unc.)

SYN. Scolia fossulana, *Fabr. Syst. Piez.* 242. *No.* 18.
Sphex plumipes, *Drury, App. vol.* 2.

HABITAT: New York.

Head pale yellow in front, black on the top and hairy. Antennæ black, and shorter than the thorax. Neck hairy, lemon-coloured. Thorax black, and covered with yellow hairs. Wings dark brown, almost transparent; not folded or doubled together. Abdomen black underneath and lemon-coloured above, where it has three black lines crossing it, two of them being broadest in the middle. Anus and breast

black. Legs black and hairy; the hinder ones being furnished with two remarkable long spines at the tips of the tibiæ. Tarsi, particularly those of the hinder legs, furnished with very strong hairs, or rather bristles at each of the joints; pale yellow-coloured.

I should have retained the specific name given to this insect by Drury, on account of its priority, but it is so inappropriate, not only being applicable to one sex alone, the female, but the spines on the fore legs being found throughout the genus, as well as in nearly all the burrowing Hymenoptera. Fabricius has incorrectly referred this figure to his Scolia radula, which has a spotted thorax.

PELOPÆUS CÆMENTARIUS.

Plate XLIV. fig. 6. Imago—fig. 7. Cocoon—fig. 8. Imago taken out of the Cocoon.

Plate XLV. fig. 8. Nest—fig. 9. Section of the Nest—fig. 10. two Cocoons exposed.

ORDER: Hymenoptera. SECTION: Fossores. FAMILY: Spegidæ.

GENUS. Pelopœus, *Latr. Fabr.* Sphex, *Linn. Drury.*

PELOPÆUS CÆMENTARIUS. Abdomine petiolato nigro, segmento primo (excl. pedunc.) lunulâ flavâ thoraceque punctis flavis, pedibus flavis posticorum femoribus apiceque tibiarum nigris. (Long. Corp. 1 unc.)

SYN. Sphex Cæmentaria, *Drury, App. vol. 2.*
Pelopœus lunatus, *Fabr. Syst. Piez.* 203.

HABITAT: Jamaica, Antigua, St. Christopher's (*Drury*). "In America insulis, in India orientali frequens." (*Fabricius*, incorrectly?)

Head black and hairy. Antennæ black, basal joint yellow. Thorax black, with short hairs on it, but next the head yellow, having a yellow spot at the base of each wing, and another next the abdomen. Wings brown, and almost transparent; lying flat, not folded. Abdomen black and round, nearly as long as the thorax; basal segment (exclusive of the peduncle) yellow; pointed at the tip, and armed with a retractile sting. Peduncle very slender, black at top, and yellow underneath; being nearly the length of the thorax itself. Breast black. Fore and middle legs black next the body, but from the middle of the thighs yellow. Hinder thighs and lower parts of the shins black, the remainder yellow. Claws black.

The following particulars relative to the economy of this species were communicated to Mr. Drury from a correspondent in Antigua, who forwarded to him specimens of the insect.

"This insect is called at Antigua, and several other places in the West Indies, the Mason Fly, a name given it from the remarkable manner in which it builds its nest, or receptacle for its young.

"When the male and female have performed the business of copulation, their* next care is to provide a proper habitation for raising and securing their future progeny; to this end they seek out a proper spot that is secure from rains, &c. and is so situated as to afford a

* From our information respecting the habits of the indigenous and European species of Fossorial Hymenopterous insects, including the Pelopœus spirifex, it is evident that the male takes no share in the labour of constructing the nest. See my memoirs upon this subject in the "Annales de la Société Entomologique de France," for 1836, and the Transactions of the Entomological Society of London, vol. i. for the same year, and the Memoirs of Saint Fargeau and Shuckard therein referred to.

sufficient warmth for the young offspring, but not so hot as to destroy instead of nourishing them. The sides of a wall underneath the eaves of a house, is the place often pitched on for this purpose. Thus prompted by nature, and instinctively knowing the necessity of performing this work, they carry a quantity of dirt, and place it against the wall, which they temper and soften with a liquor issuing from their bodies, that renders it sufficiently strong and tenacious, and when dry, is proof against any rains that may happen to get at it. The nest is composed generally of about a dozen cells, that are round, and sufficiently capacious to hold the caterpillar when grown to its full size; each of which is about an inch long, and about three-eighths of an inch in diameter, lying parallel with each other, and formed in such a manner, that each cell lies between two others, both above and below it, except the outward ones, having a hole left open at the extremity of each, for the parents to go in and out at pleasure. See Plate 45. Fig. 8. that at 9 being a nest supposed to be cut through its middle, to shew the form of the cells, and manner of their being built. The industry exerted on this occasion is remarkably great, for in a few days the whole is completed. There is no doubt but the heat of the climate greatly contributes to facilitate this work, as the dirt of which it is composed is quickly dried, and by that means enables them to be very expeditious. Their next employment is procuring a number of small spiders, with which each cell is properly filled, and are to serve for food to the young brood; of these they always take care to lay in such a sufficient store, that the young ones seldom, if ever, perish from want. I have opened many of these cells, and constantly found a spider remaining uneat, sometimes two, and not seldom three, so that it is evident the parent animal makes ample provision for the appetite of its young. By the time one cell is replenished with provision, the pregnant female, finding the eggs within her ripening to maturity, and under the necessity of discharging them, lays a single one in the cell, and then covers up the hole with dirt, which was left open for a passage, in so neat and curious a manner, that the nicest eye could not discover the place where they used to enter. She then proceeds in the same manner to the next, and so on, till all her eggs are emitted and laid in their respective cells, each cell being furnished with a single egg and no more. My correspondent assures me, he is not certain whether the male assists in building the nest, or whether it is the sole production of the female; but they both equally contribute to furnish it with provision, which they carefully watch and preserve from the ants, that in that hot climate would soon rob them of. In a little time the young ones are hatched; and each, finding in its respective habitation a proper quantity of food, subsists thereon, and there lives unseen, till it arrives to its complete state. When it (the caterpillar) is advanced to its full size, it forms round itself a brown case, as appears at Fig. 7. Plate 44. and at Fig. 10. Plate 45. and in that inclosure undergoes its transformation; when it puts on its form as at Fig. 8. Plate 44. remaining with its legs, wings, and horns, closed round, as is there shewn, till it has acquired strength to break its enclosure. At its first assuming this form, it is white, soft, and tender, and its wings shorter than those in the figure; in a few weeks its becomes hard, strong, and of its proper

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colour. The wings, also, before that time, grow to their proper size; and now, finding itself arrived at a period when the forementioned circumstance of its confinement is no longer necessary to its well being, it obtains its liberty, by making a hole at the end of its cell, with its jaws and fore legs, large enough to permit its escape.

"The separation of the thorax and abdomen, by such a long slender membrane or ligament, is very singular, and the power the insect is invested with, by means of those jaws or forceps placed at its mouth, is really wonderful; for the number of insects, of a superior strength, as well as size, which it is capable of destroying, is scarcely credible. It will overcome a spider of twice its own size, if it can but get upon the back of it, by means of its forceps and sting: nor will multitudes of other insects find it a less formidable enemy, if they are not guarded by nature with a covering too hard to yield to the force of these destructive weapons. In short, it seems to be an animal formed by nature, as one of those instruments instituted for subduing and lessening the vast numbers of small insects that abound in warm climates."

LEPTOSCELIS PICTUS.

Plate XLV. fig. 1.

ORDER: Hemiptera. SUBORDER: Heteroptera. SECTION: Geocorisa, *Latr.* FAMILY: Coreidæ, *Leach.* (Anisoscelites, *Laporte.*)

GENUS, LEPTOSCELIS, *Laporte.* Anisoscelis p. *Burm.* Lygæus p. *Fabr.*

LEPTOSCELIS PICTUS. Niger, capitis lineâ dorsali, thoraceque crenulato rufis, hoc antice maculâ marginaque postico nigris, femoribus gracilibus denticulatis, abdomine supra cyaneo maculis marginalibus rufis. (Long. Corp. 7½ lin.)

SYN. Cimex pictus. *Drury, App. vol.* 2.
Lygæus crenulatus, *Fabr. Ent. Syst.* 4. 144. 33. *Syst. Rh.* 250. 11. (Alydus cr.)

HABITAT: Antigua.

Head small and slender; red, striped with black. Eyes round and projecting. Antennæ black, and nearly the length of the insect; four-jointed. Thorax red, with black marks near the head, and another near the abdomen; the sides lying high and angular. Scutellum black and triangular. Hemelytra dark (almost black), the apical membrane being rather less so than the basal portion. Wings almost transparent. Abdomen above, blue along the centre, and red on the edges, indented with black; beneath red and brown, as are also the breast and sides. Legs black. Hinder thighs, having several spines on them. The proboscis extends to about the middle of the abdomen.

This species is very closely allied to the insect figured in Plate 43, fig. 3.; nevertheless, their descriptions are placed very widely apart in the Systema Rhyngotorum. They appear to form a good subgenus, nearly allied to Hypselopus of Burmeister, which is confined to Africa.

EUMENES ABDOMINALIS.

Plate XLV. fig. 2.

ORDER: Hymenoptera. SECTION: Diploptera. FAMILY: Vespidæ, *Leach.*

GENUS. EUMENES, *Fabr. Latr.* Vespa, *Linn. Drury.*

EUMENES ABDOMINALIS. Fusco-fulva, antennis fuscis apice nigris, abdomine pyriformi petiolo longo nigro apice fulvo, segmento sequenti nigricanti. (Long. Corp. 10½ lin.)

SYN. Sphex abdominalis, *Drury, App. vol.* 2.

HABITAT: Jamaica.

Head brown yellow. Eyes black. Antennæ brown, but near their extremities black, being the length of the thorax. Thorax brown yellow. Wings membranaceous, yellowish, and almost transparent, being folded longitudinally. Abdomen round, and longer than the thorax, brown yellow; the first segment (exclusive of the peduncle) black, with several black spots or streaks on the under side. It is attached to the thorax by a curved peduncle, considerably less than itself, being black; but at the tip yellow, and of the length of the thorax. Breast and sides black, streaked with brown. Legs brown yellow, furnished with a spine at the tips of the tibiæ, except the hinder ones, which have two.

CENTRIS GROSSA.

Plate XLV. fig. 3.

ORDER: Hymenoptera. SECTION: Mellifera. FAMILY: Apidæ, *Leach.*

GENUS. CENTRIS, *Fabr.* Apis, *Linn. Drury.*

CENTRIS GROSSA. Aureo-viridis, nitida; antennis pedibusque nigris. (Magn. Bomb. terrestr.)

SYN. Apis grossa, *Drury, App. vol.* 2.

HABITAT: Jamaica.

Head black, inclining to blue, with a mixture of green. Eyes large. Antennæ black, and shorter than the thorax. Tongue yellow, and secured within its brown case. Thorax shining, of a dark golden green, with a mixture of blue, having a few black hairs on it. Wings membranaceous and brown. Abdomen of the colour of the thorax, but underneath more of a mazarine blue. Breast the same. Legs hairy and black; posterior tibiæ more so than the others.

This fine species appears nearly allied to the Centris versicolor, Fabr. (Syst. Piez. 359. 23.) which is an inhabitant of the Islands of America, but which is described thus, "thorace hirto cinerascente, abdomine cyaneo, ano rufescente."

ECHINOMYIA HIRTA.

Plate XLV. fig. 4.

ORDER: Diptera. SECTION: Athericera. FAMILY: Muscidæ, *Leach.*

GENUS. ECHINOMYIA, *Dumeril.* Tachina, *Fabr.* Musca, *Drury.*

ECHINOMYIA HIRTA. Atra; alis obscuris, abdomine rufo-fusco setis longis nigris obsito, pedibus nigris. (Magn. Muscæ carnariæ.)

SYN. Musca hirta, *Drury, App. vol.* 2.

HABITAT: Jamaica.

Head black. Eyes light brown. Antennæ like jointed scales, not hairy. Thorax above almost black, with a few hairs on the sides. Wings brown and opake, not transparent. Abdomen red brown, covered with very long black hairs. Legs black.

REDUVIUS (CONORHINUS) VARIEGATUS.

Plate XLV. fig. 5.

ORDER: Hemiptera. SUBORDER: Heteroptera. SECTION: Geocorisa. FAMILY: Reduviidæ, *Leach*.

GENUS. REDUVIUS, *Fabr.* Cimex, *Linn.* SUBGENUS: Conorhinus, *Laporte*, *Burm.* Triatoma, *Lap. olim.*

REDUVIUS (CONORHINUS) VARIEGATUS. Niger; thoracis lateribus maculisque marginalibus abdominis ferrugineis, corio nigro rufo-marginato. (Long. Corp. fere 1 unc.)

SYN. Cimex variegatus, *Drury, App. vol.* 2.
Reduvius gigas, *Fabr. Syst. Rh.* 267. 3. *Burmeister* II. 246. 1.? (Conorhinus 9.) *Stoll.* 18. *f.* 85.? *Wolff*, 12. *f.* 113.?

HABITAT: Antigua.

Head black and small. Eyes black. Antennæ black, and shorter than the insect. Thorax black, the sides red brown and angular. Scutellum small, black, and angular. Basal portion of the hemelytra black, verged with red; the apical membrane opake and brown. Wings transparent. Abdomen black, with red spots on its sides, which are seen also beneath. Legs black, yellow at the base.

The antennæ of this insect, as represented in the figure, are quite unlike those of any of the Reduviidæ, although in every other respect, and more especially in the peculiar neuration of the membranous part of the upper wings, it agrees with the Reduvius gigas of Fabricius, a species very widely dispersed, being found in South America, Sierra Leone, East Indies, as well as the Island of Mauritius.

ERISTALIS CINCTUS.

Plate XLV. fig. 6.

ORDER: Diptera. SECTION: Athericera. FAMILY: Syrphidæ, *Leach*.

GENUS. ERISTALIS, *Meigen.* Musca, *Drury, &c.*

ERISTALIS CINCTUS. Ater; thorace punctis quatuor fasciâque posticâ sulphureis, abdomine castaneo fasciâ mediâ sulphureâ. (Magn. Musc. carnariæ.)

SYN. Musca Cincta, *Drury, App. vol.* 2.

HABITAT: Jamaica.

Head large and black. Eyes brown (antennæ broken off). Thorax black, with two yellow spots next the head, and one on each side, at the base of the wings, with a yellow line crossing it next the abdomen. Scutellum chesnut-coloured. Abdomen chesnut-coloured at the base, with a yellow ring crossing the middle; at the extremity golden green. Legs and breast black. Wings transparent.

ECHINOMYIA PILOSA.

Plate XLV. fig. 7.

ORDER: Diptera. SECTION: Athericera. FAMILY: Muscidæ.

GENUS. ECHINOMYIA, *Dumeril.* Tachina, *Fabr.* Musca, *Drury.*

ECHINOMYIA PILOSA. Atra; setis rigidis numerosissimis obsita, alis opacis fuscis, capite brunneo. (Echin. hirtà paulo minor.)

SYN. Musca pilosa, *Drury, App. vol.* 2.
Tachina hystrix, *Fabr. Syst. Antl.* 310. 8. *Weidemann Auss. Zw. Ins.* 2. 284.

HABITAT: Jamaica.

Head red brown. Antennæ short and thick, without hairs. Thorax and abdomen entirely covered with thick black hairs, or rather bristles, when compared with the size of the insect. Wings opake and brown, not transparent. Breast black, covered with black bristles. Legs black, spinose.

MYRMELEON LIBELLULOIDES.

Plate XLVI. fig. 1.

ORDER: Neuroptera. SECTION: Filicornes. FAMILY: Myrmeleonidæ, *Leach.*

GENUS. MYRMELEON, *Linn. &c.*

MYRMELEON LIBELLULOIDES. Alis fusco punctatis maculatisque corpore nigro flavoque maculato. (Expans. Alar. 4 unc. 9 lin.)

SYN. Myrmeleon Libelluloides, *Linn. Syst. Nat.* 1. 2. *p.* 913. 1. *Fabr. Ent. Syst.* 2. 92. 1.? *Latr. Gen. Crust. & Ins.* 3. 191,
Libella turcica major alis locustæ, *Pet. Gaz.* 6. *t.* 3. *f.* 1.

HABITAT: Smyrna *(Drury).* "In Europa australiori et per totam Africam" *(Latreille).*

Head dark yellow, divided by a black line, which runs along it from the thorax. Antennæ black and clubbed, small at the base, and gradually increasing to their extremities. Thorax brownish yellow; having a black line running along its upper part, and two small black spots at the base of the superior wings, being covered with greyish hairs. Abdomen about an inch and a quarter long, yellow, with a black line on the top, and one on each side; the male having two small horny tails issuing from the extremity. Wings membranaceous and pellucid (the inferior ones being as long as the superior), and elegantly adorned with a great number of dark spots of various shapes and sizes.

Fabricius gives the Cape of Good Hope as the habitat of this species, referring not only to the present figure, but also to that given in Vol. 3. Plate 41. which is said by Drury to have been brought from Sierra Leone. This is the more inexcusable, because Drury expressly observed in a note, "There is a species found near the Cape of Good Hope very much like this, but distinctly different," although in the synoptical appendix to the third volume, he gives the large species from Sierra Leone as a variety of M. Libelluloides.

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EUPTILON ORNATUM.

Plate XLVI. fig. 2.

ORDER: Neuroptera. SECTION: Filicornes. FAMILY: Myrmeleonidæ, *Leach.*

GENUS. EUPTILON, *Westw. Gen. Nov.* Hemerobius, *Linn. Drury.*

EUPTILON ORNATUM. Viride, thoracis puncto antico abdomineque lineâ dorsali nigris, alis hyalinis venis numerosissimis, strigisque duabus obliquis obscuris. (Expans. Alar. circ. 3 unc.)

SYN. Hemerobius ornatus, *Drury, App. vol.* 2.

HABITAT: Dinwiddie, in Virginia.

Head dark green. Antennæ pectinated or combed. Eyes black. Thorax dark green, with a black patch next the head. Abdomen dark green, with small rings of yellow, and a small black line running along the upper side from the thorax to the extremity. Wings membranaceous and pellucid, or transparent, of equal length; the superior ones having two small transverse black stripes placed near their posterior edges, at about half an inch distance from each other.

Latreille, in his Genera Crustaceorum et Insectorum, Vol. 3. p. 199, after describing the genus Chauliodes belonging to the family Hemerobiidæ, observes, "Congenerica videntur insecta a Dom. Drury iconibus vivis expressa, tom. 1. Pl. 46. Fig. 2. 3." I have never seen the present species, but from the admirable accuracy of Moses Harris (by whom the figures were drawn) it is evident that the neuration of the wings of this species is identical with that of Myrmeleon, agreeing especially with the insect represented at Fig. 4. of this plate, and exhibiting the irregular longitudinal nerve below the subcostal nerve and the strong furcate nerve running along the middle of the wing; whilst, at the same time, the neuration is quite unlike that of Fig. 3. Hence I have no hesitation in placing this insect in the family Myrmeleonidæ. It however disagrees with the genera of which that family is composed, viz. Myrmeleon, Linn. (Myrmecoleon, Burm.) Ascalaphus, Fabr. and Nymphes, Leach, in having bipectinated antennæ, so that I have been compelled to establish a new genus for its reception. Can it be possible that, according to the not uncommon practice of the time, the specimen had been mended, and that pectinated antennæ had been substituted in the stead of the ordinary ones of a Myrmeleon?

CHAULIODES VIRGINIENSIS.

Plate XLVI. fig. 3.

ORDER: Neuroptera. SECTION: Filicornes. FAMILY: Hemerobiidæ, *Leach.*

GENUS. CHAULIODES, *Latreille*, Hemerobius, *Linn. Drury.*

CHAULIODES VIRGINIENSIS. Capite thoraceque nigris fulvo punctatis, alis latis hyalinis venis nigro punctatis. (Expans. Alar. 3 unc.)

SYN. Hemerobius Virginiensis, *Drury, App. vol.* 2.
Hemerobius pectinicornis, *Linn. Syst. Nat.* 1. 2. 911. 1.? *Pal. Beauv. Ins. Afr. et Am. Neur. pl.* 1. *f.* 2.?

HABITAT: Virginia.

Head black, with a yellowish spot in the front, and another on the top. Eyes greyish, and shining like polished bell-metal. Antennæ pectinated or combed, and longer than the thorax. Ocelli three. Thorax black, with three small yellowish spots on the posterior part. Abdomen almost black at top,

and underneath of a greyish yellow (as are all the legs), having two short setæ or tails at the extremity. Wings membranaceous and transparent; the nerves appearing, when viewed by a magnifier, to be black and white, like the quills of a porcupine. Inferior wings shorter than the superior.

Drury has figured the wings as of an uniform colourless appearance, which induces me to consider that it may be distinct from the Linnæan H. pectinicornis, that species being described by the great Swede with "*signaturis* nervisque fuscis albo subarticulatis." From the paleness of the present species it is evident that the transverse nerves connecting the longitudinal ribs of the wings in the typical species of this genus have been overlooked, especially as the longitudinal nerves are correctly represented. This genus and Corydalis, seems to form a connecting link between Hemerobius and Perla.

MYRMELEON AMERICANUM.

Plate XLVI. fig. 6.

ORDER: Neuroptera. SECTION: Filicornes. FAMILY: Myrmeleonidæ, *Leach.*

GENUS. MYRMELEON, *Linn, &c.*

MYRMELEON AMERICANUM. Thorace griseo nigro notato, alis hyalinis fusco et luteo punctatis, punctis nonnullis lineam centralem longitudinalem formantibus, abdomine fusco. (Expans. Alar. 5 unc.)

SYN. Myrmeleon americanus, *Drury, App. vol.* 2.

HABITAT: New York.

Head black, front grey and hairy. Mouth with four long palpi. Eyes dark brown, almost black. Antennæ black, and as long as the thorax; being small at the base, and increasing in size to their extremities. Neck yellowish, striped with black, and covered with longish grey hairs. Thorax yellowish, with black stripes, and covered with long grey hairs. Abdomen, which is full an inch and a half long, brownish-coloured, and darker on the sides; being furnished at the extremity with two short hairy tails, seemingly of a horny substance. Wings of equal length, membranaceous and transparent, having a great number of small spots thereon of a dark brown colour; the superior ones being most spotted. Legs black, and covered with grey hairs; each of them being furnished at the tips of the tibiæ with two long spines that bend inwardly towards each other.

LIBELLULIDÆ, Pl. 47 & 48.

All the insects represented in these two plates belong to the genus Libellula of Linnæus, or the family of Dragon-flies, Libellulidæ. When the original edition of this work was published, there was no English work in which the natural history and curious transformations of this tribe of insects were detailed. Our author, therefore, in order to supply the deficiency, published the following interesting series of observations upon the subject:—

"As I have not met with any English author who has given the natural history of the insects delineated in these two plates, I shall make no apology for its introduction;

the frequent opportunities I have had of observing their mode of life and action, together with the many singular circumstances observable in both, being motives for its publication too powerful to be resisted.

"It is not easy to determine whether they should be ranked among the water insects, or those of the land, nor shall I attempt here to ascertain it; my present business being only to relate the several circumstances attending them during their respective states in which they are passing from the egg to the complete animal: and although these observations have been confined to our English ones, yet they so exactly agree and coincide with those of foreign countries, (as my correspondents have assured me), that their nature and behaviour appear to be just the same; so that what is observable in ours, is at the same time applicable to the whole genus wherever found.

"If we take a cursory view of the different ranks of animals that inhabit our globe, we shall hardly find one that can excite our wonder and astonishment more than this genus; nor is it from that general ignorance of the insect world, that reigns so strongly in these kingdoms, that I am emboldened to say this; but if we reflect that the beasts, birds, and reptiles are furnished with powers for living only in the air, and that even the amphibious tribes can perform the office of respiration only in that element: if we also consider that fishes, on the contrary, are unable to respire but in water, and when deprived of that must certainly perish, we cannot but conclude that all these animals are most wisely fitted with means and faculties for filling up the respective orders and ranks wherein they are placed. But let us cast our eyes on the subjects I am about to describe, and there behold a tribe of beings, who, as soon as they leave their eggs, subsist for a certain number of months, (I had almost said years), creeping and swimming in the liquid element; are there invested with organs and powers for existing and weathering out the utmost severity and intemperance of the winter; that afterwards as the spring and summer advances, and the period arrives when they are to appear in other forms, in the space of about half an hour those very organs and powers that before enabled them to live under water should be so entirely altered, the very natures and abilities of the creatures so changed as to permit them to quit their former element and place of residence, insomuch that all the remaining part of their lives is spent in the open air, furnished with wings, and flying about in the full glee of wanton liberty; that in a very few weeks after, having performed the business of generation, the same animals should die of mere old age, with their wings quite ragged and worn out, their strength exhausted, and all the powers of their bodies lost by a total imbecility and weakness, which but a little before enabled them to transport themselves through the air with the swiftness of a bird. If, I say, we reflect on all these circumstances, we cannot but allow them to be objects of a very extraordinary nature, and well adapted for leading the mind to the contemplation of their supreme Author, who has thought proper to exhibit to us these kind of insects, thus differing from almost all the animals in the creation.

"They have been variously named by different authors, owing perhaps to the time when they wrote, or the progress natural history had made in the world. Some have called them by the name of Dragon Fly, others Adder Bolt, Balance Fly, Perla, Libellula or Libella. I shall prefer the last, as conveying an idea well known to English adepts. The caterpillars of them all live in ponds and stagnant waters (that are undisturbed by cattle) during the greatest part of their lives, and make their appearance under three general forms. The first is shewn by Fig. 1. 1.; the second by Fig. 2.; and the third by Fig. 3. See Plate 47. As these are the shapes in which they all appear, it will not be improper to mention each particularly.

"The two caterpillars at Fig. 1. 1. Plate 47, belong only to or produce those that sit at rest, with their wings erect, (see Plate 48. Fig. 2.), and differ from both the others not only in size but in the roundness and slenderness of their bodies; at the extremity whereof they are furnished with three tails, each of which upon examination being found to be a kind of feather, and is an appendage that neither of the others have. Their behaviour also in the water is different from the others, being enabled to twist and bend their bodies in a more circular manner. [Subfamily Agrionides.]

"The second sort of caterpillars, at Plate 47. Fig. 2. are much shorter and thicker in their bodies than either of the others, producing those Libellas with flat bodies, as Plate 47. Fig. 4. and 6. and Plate 48. Fig. 1. and 5. These are, of all others, the most disagreeable in their appearance; most of them having their bodies and legs very rough and shaggy, and of the exact colour of mud. Others appear of a dirty green, and very unpleasing hue, a colour that in general reigns among them all; for none can boast of any beautiful appearance while in this state, unless the different shapes here exhibited can be called so. Indeed the beauty and symmetry, so apparent in their complete states, make ample amends for the want of it in this; all of them in general being then very beautiful, discovering colours superior to art. [Subfamily, Libellulides. Genus, Libellula.]

"The caterpillars of the third sort (see Plate 47. Fig. 3.) are very different from the preceding, being the size of the figure, with the abdomen flat at bottom and rounding at top, longer and slenderer than those at Fig. 2. but not so much as those at Fig. 1. 1. These produce those large Libellas with long slender bodies, who sit at rest with their wings expanded, as Plate 47. Fig. 5. [Subfamily, Libellulides. Genus, Æshna.]

"Under these three forms are all the caterpillars of Libellas found, there being but little difference in the colours or marks of the respective tribes; the various sizes and shapes being the chief observable circumstances attending them. They are all furnished with six legs, and have each of them four little membranaceous substances issuing from the back, or upper part of the thorax, that are the follicles, or cases, wherein the wings are inclosed. When the young caterpillars issue from their confinement in the eggs, there is no appearance of these cases, nor till a considerable time after; but as they arrive to a maturer state they become more conspicuous, and, like the young leaves of trees that open

and expand themselves on the arrival of the spring, their appearance increases, till having approached the period when they are to forsake their former habitations and become inhabitants of the air, these wing-cases have then arrived to their due size, and carry the appearance in which they are here seen. They are all of them, from the largest to the smallest, armed with a strong offensive weapon, which serves them, and is indeed the means they are endued with, for obtaining their food. This weapon being placed in the under part of the head, just beneath the mouth, I have displayed in Fig. 1. and 3. of Plate 47. where it appears just in the same manner as when they are endeavouring to catch their prey. In the largest figure at 1. and also in Fig. 2. it appears contracted and shut up, as when at rest. The strength and power that these animals discover in the use of this instrument is very singular and extraordinary. There are two joints to it, one about the middle, the other underneath the mouth, close to the throat; and in some (particularly all those of Fig. 2.) when it is closed or contracted, it appears fastened to the face of the creature, by fitting it so exactly as to form a perfect mask; covering the mouth, and reaching almost as high as the eyes. In others it is made to fit only the under part of the mouth, and when at rest is drawn up close underneath it. At the extremity of those that are extended may be observed two very strong and remarkable fangs; that, shutting over each other, form a pair of forceps, of such strength that few, if any of their captives, can escape if once inclosed therein. [This organ is the greatly developed lower lip of the larva, and is analogous in its structure to the same part in the imago.]

"The motion of these creatures in the water, particularly those of the largest size, is very slow; seldom exercising any swiftness or activity, unless they are disturbed and threatened with danger, in which case they can transport themselves to places of more security with the quickness or agility of a fish; but, in general, they appear to have so little inclination to move, that I have often seen them (I mean those that I have kept in glass bowls) remaining in their respective places above a week together, and could not discover the least motion in them, unless under the circumstance above mentioned, or when they had seen their prey and were advancing to seize it. The caterpillars of Fig. 1. 1. and 3. generally fix themselves to some little stick or straw, &c. that they find in the water, and there remain, as I said before, without stirring. Those of Fig. 2. are more frequently seen in motion among the thickest part of the roots and plants that grow there, routing and searching for those small animals inhabiting that part, which are their proper food. This aversion to motion, so apparent in those of No. 1. and 3., appears to me to be the effect of an extraordinary cunning and sagacity; and may be considered as the principal means by which they obtain their prey: for while they continue thus motionless in the water, the small animals, who constitute their proper food, approach them with less fear than they would otherwise do, not suspecting their grand enemy lies upon the watch to seize them the moment they come within his reach; but no sooner has their insensibility of danger brought them within a small distance of those destructive weapons (mentioned before, being placed under their mouths) but that very instant they dart upon them with

the utmost rapidity, suddenly throwing out their forceps, and seizing them with as much eagerness as a pike does the unwary gudgeon; they then bring their forceps up to their mouth with their prey in it, and feast on their captive prisoner. Nor is their voracious nature less astonishing; and the greediness with which the large ones seize other small animals would hardly gain belief among persons entirely ignorant of this study. I have seen one of them, in less than an hour's space, devour three insects, each of which was full two thirds as big as itself; but, in general, the small ones are the sacrifices made by the greater; wherein I must observe, that when they have got a caterpillar of the small Libellas in their forceps, such as those of Fig. 1. Plate 47., they leave no part uneaten, except the three tails, which they let fall to the bottom, as perhaps not having substance in them sufficient to afford them proper nourishment; for as their food consists altogether of animals less than themselves, they neither spare the caterpillars of the lesser Libellæ, nor confine themselves to those belonging to other tribes. They will eagerly prey upon the different kinds of Cads, or caterpillars of the Phryganeæ; great numbers of whom, at certain seasons, quit those husks or cases they make and swim about, with less fear and dread than in the early part of the spring. I have also seen the caterpillars of the Notanecta's or Boat-flies devoured by them, and not seldom the small blood-worms, as they are called. In short, there are but few of the lesser animals that live in the water, but when once they get within the reach of their instruments will certainly fall victims to these fresh-water Leviathans.

"I could never observe that these caterpillars ever threw off any exuvia, or skin, in their progress from the egg to the complete animal, as most other insects do that live in the open air; neither could I ever perceive any difference between the caterpillars and chrysalis's of this genus in their outward forms*: the same voracious behaviour in seizing and devouring their prey, reigning both in one and the other; but that they internally undergo some material alteration, when passing their respective states, is what I do not entertain the least doubt of; as the organs of respiration during the creature's life in the water, appear to me to be under a necessity of receiving a great alteration, when they are to perform the same office in so different a medium as the air; nor can I suppose this business to be done in so quick and sudden a manner, as the short space of time in which the creature would then be passing from the caterpillar state to the perfect one would permit, without having the intestines prepared, as it were, and fitted by some previous change. However, as this is conjecture only, I shall dwell no longer on this head, my present purpose being to point out and describe their general circumstances and behaviour.

"When the caterpillars of the respective species have arrived to their full growth, and nature informs them they are to quit their former element of water, for one wherein they are to appear invested with very different powers, they prepare for this extraordinary change; and, creeping up the sticks, straws, or plants they find for their purpose, whose tops grow out of the water, they entirely quit that element, and, stopping at about six or

* The presence of the dorsal wing cases indicates the arrival of the insect at the pupa state.

eight inches above its surface, there fix themselves, and continue some time, till their internal form, growing too big to be confined within the skin, that a few minutes afterwards will be entirely thrown off, on a sudden, that part of it that covers the thorax, splits or bursts on the upper side, and the creature, pushing out its head, next disengages its fore legs, which fastening to any substance within its reach, draws gently the remainder of its body and legs entirely out, just as a man draws his leg out of a boot, leaving its slough or skin sticking in its place, and in the exact form wherein it appeared itself but a few moments before. Having thus quitted its former covering, it waits for the wings to expand themselves, and grow to their proper size, being before confined within those small cases I mentioned were placed on its back. In about half an hour, if the weather is favourable, this extraordinary operation is completed; and the wings having arrived to their proper size, the creature generally makes an effort to try its strength, well knowing, that if it fails in attempting to fly without being endued with a sufficient degree of it, it must certainly fall in that water it lately quitted, and there perish; but having made several motions with its wings, and finding its power equal to its desire, it suddenly flies into the air, and there fills up a character, as different from the former as one element is from the other. At the time this change is accomplishing, the instrument or weapon for catching their prey, before mentioned, by an effect of nature, totally disappears, and not the least vestige of it then remains; the mouth, indeed, is furnished with jaws, and those of a very extraordinary form (dividing themselves both horizontally and perpendicularly), but no part of them appear extended beyond the rest, or have the least appearance of being furnished with an instrument like what they had in their former state.*

" Hitherto I have considered these creatures only in their infant or incomplete states; wherein the faculties and powers they are endued with, are entirely different from those of their perfect and complete ones. In the former I have described them swimming and grovelling about in the water, preying upon the lesser kinds of insects, being incapable of subsisting for any length of time out of that element; in the latter we must view them capable of flying in the open air, and conveying themselves from place to place. If they are then confined to the limits of a small pond, they are now capable of roving from tree to tree, and from field to field, darting and skimming along with all the rapidity and seeming joy, that a being sensible of, and exulting in its own powers, can be supposed to do; in short, we

* " The morning is the time they generally choose for completing this change, because I am pretty certain it is in their power to retard this regeneration considerably, if I can judge from concurrent circumstances attending those I have kept in glass bowls, on purpose to observe their nature and behaviour. In one of these I have seen two libella-caterpillars, that were fully grown, for three days successively creep up the straws out of the water, in order to undergo their transformation; but finding themselves deprived of the sun-shine, (a circumstance generally attending this performance,) or at least that agreeable warmth of air so necessary for their purpose, they retired into the water: in an hour's time they made another essay, but finding the same circumstances subsisting as before, they again retired under water, and this they continued doing for three mornings; till at length one of them, wearied out by those frequent efforts, the period of nature not being to be totally avoided or suppressed, although it might be retarded, perished in the water, being at length so weak as to be unable to creep above its surface. The other, on removing the vessel into the sunshine, yielded its proper insect."

must now view them in shapes so distinct and different from their former ones, that they hardly seem to bear any relation to each other, except in their nature and appetites; for although they appear in a far more elegant dress than when in their caterpillar states, yet these are just the same, the same voracious inclinations subsisting now as formerly; hunting after, and preying upon, the lesser genera, with the same eagerness and desire as they did when inhabitants of the water. Incredible numbers of small moths, bees, flies with four and two wings, are the daily sacrifices offered to the insatiable appetites of these hungry gluttons; and where they devoured one insect in the water they now destroy a hundred, if the mildness of the season will permit them to range about in quest of them. In rainy weather they seldom or ever move, nor when the wind is very strong and boisterous. Indeed, it is not to be wondered at. The small insects, who are their proper food, being by the same reasons prevented from being abroad, consequently are an impediment to those motives, that so strongly induce the Libellas to fly about. During such inclement times they generally shelter themselves from the wind, &c. being suspended by their feet in a perpendicular position on some twig, that is remote and separate from any boughs, waiting in that manner, without motion, for better weather and sunshine.

"I am strongly inclined to believe, that the greater part, if not all the Libellas, are two years in passing from the egg to the complete animal. But as this is a circumstance I do not remember to have seen in any author, I shall not attempt to establish my opinion as an absolute truth. I shall mention my reasons for this belief, and leave it to every person either to confirm or confute it, as his observations shall hereafter give him an opportunity.

"In order to do this, it would be necessary I should mention the times when each species first makes its appearance here in England. But as this would not only take up too much of the reader's time, (there being at least twenty-two of them) but it would likewise be impossible to be understood by any, but the experienced adept, unless I gave figures of them all; I shall therefore content myself with observing, that the Libella figured in Plate 45. Fig. 5. though found in America, about New York, &c. is nearly the same with our English one, differing but a very little from it, and which I have inserted chiefly as an instance to illustrate this subject. Ours is the last species but one, that comes forth in the summer, breeding only once a year, appearing about the 2nd of August. Therefore, to elucidate this point, suppose we allow a fortnight or three weeks from that time for all the Libellas of this species to make their appearance in, that nature intended should be bred that year; but in order to set this matter in the strongest light, I shall allow a month to that purpose. If, therefore, the Libellas were only one year in passing from the egg to the perfect state, we might justly conclude, that after the 2nd of September, (a month from the time of their first appearing) all of this species would have arrived to their complete states; and that none of their caterpillars could be found in the waters after that time, by reason they had all quitted that element, and were become flying insects. This, I say, is the conclusion we might fairly, and without presuming on the matter, make. But this is

very far from being the case. For let any one examine stagnant waters at any time during the months of August, September, or October, and from thence in any part of the following winter, and he will find these very caterpillars at any of those times; and this, not in any one particular year, but they will be found also in any one whatever, fully fed, and of the largest size. Nor are the caterpillars of this species the only ones to be found fully fed. Those of N°. 2. belonging to the flat-bodied Libella, will also be found very plentifully, many of them being of the first magnitude, together with numbers of the same species, very young according to the time of year when sought for; and appearing to have been hatched from those eggs that were laid by parent insects in the spring; for such I must conclude them to be, how else can we account for their smallness, at the same time that we may find others of the largest size? We must not suppose there can be this difference of size in the same species, owing to some eggs having been laid three weeks or a month sooner than others; that, being so short a space of time as not to allow it possible for one of those caterpillars to attain its full size, (and all the species of flat-bodied Libellas appear within a month of each other.) Nor can we be so deceived as to mistake a species of the long-bodied caterpillars, for one of the short-bodied; the difference being extremely apparent at the first glance.

"These reasons appear to me so convincing, I should have thought myself inexcuseable to have passed them over in silence, when I was giving the history of these animals. I shall therefore think myself happy to have this circumstance corroborated by future experience, or rectified and cleared up, if found to be an error. I shall only say, I have dwelt the longer on it, as it is an observation I never heard of before. I have likewise singled out the largest Libella, and the flat-bodied ones for its illustration, as being more conspicuous by their size, and easier to be observed than those of the smaller sorts.

"The two principles of hunger and lust, so apparent through the animal kingdom, are in no class or tribe more manifest and visible than in these insects. The former I have described and explained through their different states; it remains for me to shew the manner in which they obey the calls of the latter. And herein I must observe, that the different manner in which the act of copulation is performed, depends on the difference of the respective kinds; the organs of generation being placed in different parts of the body, according to the distinct species. All the flat-bodied ones have those parts placed in common with most other insects, at the extremity of the tail. In all the slender-bodied ones, the organ of the male is placed next the breast, close to the part where the thorax and abdomen unite; while the same organ in the female lies in the very extremity of the tail, and the singular manner of these creatures coupling is a circumstance worthy of observation.

"As soon as they have arrived to their perfect state, the males seek out their mates, in order to propagate their species; for this purpose they frequent ponds and standing waters, places where the females generally harbour, and when the male in the course of his flight comes within a certain distance of her, if it be one of that species whose sexual parts

in both sexes are placed in the tail, he immediately flies to her, and fixing himself by his feet to the hinder part of her abdomen, bends his body round her tail, and performs the business of generation, both flying about all the time this act is performing; the whole transaction not exceeding the space of half a minute. Within a few hours after, the female, thus impregnated, begins to lay her eggs in the following manner. She singles out a leaf, grass, or some such matter, that is floating just below the surface of the water, in some pond, and, hovering in the air about a foot above this spot, on a sudden she descends, and dips the extremity of her tail in the water, at which instant she discharges an egg, that at the moment of its emission is inveloped in a glutinous liquid, sufficiently tenacious to enable it to adhere firmly on the floating substance above-mentioned without sinking. In this manner she continues depositing them till she has discharged the proper quantity, hovering in the air all the time, and emitting them as fast as the pendulum of a clock performs its vibrations; placing them close to one another in no regular or exact order. Whether she discharges at one time all her quantity of eggs, or only those that were fecundated and ready for emission, waiting to have the remaining eggs within her again fecundated by the male, or whether the first act of copulation sufficiently impregnates the whole quantity which she discharges at different times, as nature ripens them, is a circumstance I cannot determine. However this may be, it is certain she does not discharge them all at once; but comes again to the same place, when those within her are ready for emission, and there lays them in the same manner as at first.

"In this manner all the flat-bodied Libellas copulate and lay their eggs; the others, which are formed with slender bodies, behave very differently in every circumstance; for in each of those species, when the male has singled out its mate, he flies to her, and by means of two little bony substances placed at the end of his tail, issuing on each side, and composing a kind of forceps, he fixes himself to the forepart of her neck, close behind the head, the female discovering no sign of fear while he is performing this action; having fixed himself in this position, he remains there several days, sometimes appearing with his body quite erect, at other times bending himself, and settling with his legs on the same substance she may happen to alight on, without ever quitting his hold; but flies through the air, thus united, wherever the fancy or inclination of the female disposes her to go. This behaviour we must consider as a prelude to copulation, for that is not performed till a considerable time after they are thus united; and therefore I look on it as a wooing, or act of courtship in the male. But having remained a sufficient time in this manner, that is, till the female is disposed to receive him, she bends her tail round to that part where I described the organ of generation to be placed in the male, and, being still held fast by the neck, in that attitude they perform the mandate of nature. This action being over, that in the smaller kinds takes up a considerable space of time (for I have known them in this posture above eighteen hours) the female soon after begins to lay her eggs. She flies to some rush, reed, or other plant growing in the water, and settling close to its edge dips

the end of her tail a little below the surface, and fixes her eggs to the rush or substance she is settled on; which, by means of the glutinous matter all eggs of this kind are surrounded with, adheres sufficiently fast, and there remains till the heat of the sun has brought the young animal into life; which immediately on quitting its confinement sinks to the bottom, or repairs to the place where nature directs it to seek out its food.

"In this manner all the slender-bodied tribe behave, differing only in some particular circumstances; as, for instance, the largest Libellas, as that at Fig. 5. Pl. 47. are not near so long in copulating or wooing as the small ones; for by the former this act is performed in a very short space, and while they are flying about in the air. Others, of a smaller size, are less quick in this performance; and as we descend to the smallest species, we shall find they take by much the longest time; observing, by the way, that all these slender-bodied ones lay their eggs in the same manner, that is, by fixing them to some substance to which they adhere, till they are ripened into life. My experience well informing me they never scatter them in any loose careless manner as some insects do, but are placed in such proper and apt situations as to receive the influence of the sun to bring them to maturity.

"If we attentively consider these creatures, either in their caterpillar or complete states, we cannot help concluding them to be a rank of beings of greater benefit and advantage to mankind than they appear to be at first view; for not to mention their being annual 'ministers of nature,' they are appointed by the great Governor of the universe as grand instruments for assisting to preserve that equilibrium so apparently reigning through the insect world, and which all who have made any progress in the study of natural history unanimously confess. Hence the voracious disposition of the Libellas is wisely made to answer a most necessary and beneficial purpose; and the great numbers of small insects which are daily sacrificed to their insatiable appetites, both in their caterpillar as well as complete states, is as strong an instance as any I know of the necessity and propriety of the existence of these animals. The general principle reigning through the whole animal kingdom, of the stronger preying upon the weak and defenceless, can hardly be explained to the purpose of being useful to mankind, and agreeable to the laws of nature, in any one instance more than is evidently to be observed in the subjects I have been describing. The least reflection will confirm this; for if the food of the Libellas when in their complete forms had consisted of the leaves of plants, like the locust genus, and not of those small insects they now prey on; or had it, like the beetle tribe, consisted of the superfluous parts of nature, as the putrid carcases of dead animals, rotten wood, &c. how great a chasm would there have been in the universal chain? how evident and conspicuous would it have appeared? and how could the vast number of small insects, increasing every day during the summer, be restrained and lessened? what genus of the transparent-winged class could possibly have performed this business singly? or could all the genera of flies, and even birds that we know of, have accomplished this end? could all the Dipteræ, or any other

kinds that prey on the lesser genera, have prevented such an increase of them as to become in a little time a plague too great to be borne? No. The Almighty Creator has most wisely constituted this genus for executing His commands in the manner I have described; and for this reason they must be considered as beings of greater consequence than the inconsiderate part of mankind allow them to be.

"Nor is this the only advantage arising from their existence. The still waters, where these creatures are inhabitants during their infant state, are in some degree by their assistance preserved sweet and good, that otherwise might corrupt and putrify, for the motion the waters receive by these insects is not trifling; the respiration they perform in that element being observable by a close attention, which, together with that and the motion of thousands of other insects, does in some measure contribute to keep it sweet and wholesome."

LIBELLULA LYDIA.

Plate XLVII. fig. 4.

ORDER: Neuroptera. SECTION: Subulicornes. FAMILY: Libellulidæ, *Leach.*

GENUS. LIBELLULA, *Linn. &c.*

LIBELLULA LYDIA. Subænea, abdomine (♂) cœruleo lateribus luteis, alis hyalinis, singulâ strigâ parvâ basali fasciâque latâ transversâ pone medium, fusco-chalybeis. (Expans. Alar. 2 unc. 9 lin.)

SYN Libellula Lydia, *Drury, App. vol.* 2.

HABITAT: Virginia.

Front of the head green. Eyes dark brown, very large, and placed near each other. Thorax green, having on each side two transverse yellow stripes. Abdomen of the male blue, with small yellow indented marks on the sides; that of the female yellow; the former having two little horny substances like tails at the extremity, which are wanting in the female. Wings reticulated and transparent; the middle of each being of a very dark blue colour, occupying about a third part, and crossing them from the anterior to the posterior edges, which by the reflection of white paper becomes dark brown. A dark brown stripe also, about a quarter of an inch in length, issues from the base of each wing, almost joining to the anterior edge; below which the males have a white patch placed on their inferior wings.

ÆSHNA JUNIA.

Plate XLVII. fig. 5.

ORDER: Neuroptera. SECTION: Subulicornes. FAMILY: Libellulidæ, *Leach.*

GENUS. ÆSHNA, *Fabr.* Libellula, *Linn. &c.*

ÆSHNA JUNIA. Fuscescens, unicolor (in vivis virescens?), alis hyalinis, costâ pallidè infuscatâ, stigmate oblongo, nigro. (Expans. Alar. 4 unc. 3 lin.)

SYN. Libellula Junia, *Drury, App. vol.* 2.

HABITAT: New York.

Head large, and in front of a brown yellow. Eyes brown, almost black, large, and placed close together. Thorax, when the insect was living, apparently green. The abdomen is now brown, but

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PL. XLVIII

was probably green also; for these kind of insects are very subject to lose the gay colours they exhibited when alive. Wings reticulated and transparent, appearing of a brownish colour along the anterior edges; having a small slender black stripe, about a quarter of an inch long, placed thereon near the tips, and a small angular white spot at the base of each next the body.

"This insect is very much like one we have in England, but not entirely so, differing in some circumstances from ours; and is introduced rather as a subject for illustrating the history of these insects, than as a specimen meriting a place in this work."—*Drury.*

LIBELLULA SERVILIA.

Plate XLVII. fig. 6.

ORDER: Neuroptera. SECTION: Subulicornes. FAMILY: Libellulidæ, *Leach.*

GENUS. LIBELLULA, *Auct.*

LIBELLULA SERVILIA. Alis hyalinis, basi flavis, thorace fusco, abdomine rubro. (Expans. Alar. 2 unc. 9 lin.)

SYN. Libellula Servilia, *Drury, App. vol.* 2. (1773.)
Libellula ferruginata, *Fabr. Mant. Ins.* 336. 11.
Libellula ferruginea, *Fabr. Ent. Syst. t.* 2. *p.* 380.

HABITAT: China.

This insect was of a beautiful red colour when living, but is now much altered; being considerably darker. Head red brown. Eyes darker, but not black. Thorax red brown; having a kind of ridge running along the middle of its upper side. Abdomen red brown, flat underneath, but above terminating in a high ridge, from the extremity of which a small black line runs along the upper ridge to the thorax. Wings reticulated and transparent; having a small, slender, dark stripe placed near the tip of each, and also near the body a small reddish brown cloud.

LIBELLULA CAROLINA.

Plate XLVIII. fig. 1.

ORDER: Neuroptera. SECTION: Subulicornes. FAMILY: Libellulidæ, *Leach.*

GENUS. LIBELLULA, *Auct.*

LIBELLULA CAROLINA. Thorace fusco, abdomine (♂) cæruleo, alis hyalinis, posticis basi dentato maculâ magnâ ferrugineâ flavo cinctâ. (Expans. Alar. 3 unc. 9 lin.)

SYN. Libellula Carolina, *Linn. Syst. Nat.* 2. 904. 17. *Amoen. Acad.* 6. 411. 85. *Fabr. Ent. Syst.* 2. 382.
Libellula Chinensis, *De Geer, vol.* 3. *tab.* 26. *f.* 1.

HABITAT: New York, Virginia, China, Madras *(Drury).*

Front of the head dark yellow. Eyes large, and situated near together. Thorax dirty green. Abdomen round; and in some appears to have been of a yellow, in others of a blue, colour. Wings reticulated and transparent; the superior (being narrowest) have only a small dark spot on the anterior edge of each near the extremity; all the remaining part being transparent. The inferior have also a small dark spot on each, like the superior; but close to the abdominal edge they have a large dark

cloud on each, which reaches from the anterior edge almost to the posterior. At this part the wings are much broader than is generally observed in any of this genus; gradually widening from the extremity to the abdominal edge.

AGRION VIRGINICA.

Plate XLVIII. fig. 2.

ORDER: Neuroptera. SECTION: Subulicornes. FAMILY: Libellulidæ, *Leach.*

GENUS. AGRION, *Fabr.* Libellula, *Linn.* Calepteryx, *Leach.*

AGRION VIRGINICA. Aureo-viridis, abdomine nigro, alis fusco-luteis apice nigricantibus, stigmate (♀) albo. (Expans. Alar. 2 unc. 9 lin.)

SYN. Libellula virgo var. Gamma, *Drury, App. vol.* 2. (Exclus. Syn. *Linn.*)

HABITAT: Virginia.

Head beautiful golden green. Eyes round, black, not so large as those in the other figures, and placed at a distance from each other. Thorax golden green. Abdomen black, long, and slender. Legs black, very spinose. Wings reticulated, and of a fine shining brown, somewhat inclining to dark blue, with a remarkable white oval spot near the tips of each, which part is much darker than the rest; but in the males is the same, the wings there being of a deep mazarine blue, almost black, and without the white spots.

Drury observes of this insect, that "it is somewhat like one we have in England, but distinctly different, and soon to be discovered by comparing them together." He nevertheless applied to it the name of the English species, which I have been consequently obliged to reject.

LIBELLULA BERENICE.

Plate XLVIII. fig. 3.

ORDER: Neuroptera. SECTION: Subulicornes. FAMILY: Libellulidæ, *Leach.*

GENUS. AGRION, *Fabr.* Libellula, *Linn.* Calepteryx, *Leach.*

LIBELLULA BERENICE. Lutea, thorace nigro lineato, abdomine (♂) cœruleo; (♀) luteo; alis hyalinis nubilâ centrali costali fuscâ stigmateque nigro. (Expans. Alar. 2 unc. 3 lin.)

SYN. Libellula Berenice, *Drury, App. vol.* 2.

HABITAT: Virginia, New York, Maryland.

Front of the head yellow. Eyes brown, large, and joined close together. Thorax yellow, and beautifully marked with black stripes, both at top and on its sides; the former running parallel with it, the other obliquely. Abdomen yellow, the characteristic of the female; but in the other sex blue, with black joints. Legs black. Wings transparent, with a slender black spot near the tips of each; in the middle of each also is a rather large dark cloud placed on the anterior edge, and another at the base next the body.

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CORDULEGASTER SABINA.

Plate XLVIII. fig. 4.

ORDER: Neuroptera. SECTION: Subulicornes. FAMILY: Libellulidæ, *Leach.*

GENUS. CORDULEGASTER. *Leach, Steph.* Libellula p. *Drury.*

CORDULEGASTER SABINA. Ænea, thorace nigro lineato; abdomine clavato nigro, flavo annulato, alis hyalinis stigmate minuto. (Expans. Alar. 3 unc. 3 lin.)

SYN. Libellula Sabina, *Drury, App. vol.* 2.

HABITAT: China, and the Island of Johanna, near Madagascar.

Front of the head green. Eyes brown, large, and placed close together. Thorax green, with three black longitudinal stripes at top, and with several others running obliquely on its sides. Abdomen, next the thorax, large and green, with black transverse stripes, but of a sudden becomes very small and slender for about five-eighths of an inch; black, with yellow rings; afterwards it becomes broad near the extremity, where it is black, the apex being yellow. Legs black. Wings transparent, except a small slender spot near the tips of each on the anterior edges.

LIBELLULA PULCHELLA.

Plate XLVIII. fig. 5.

ORDER: Neuroptera. SECTION: Subulicornes. FAMILY: Libellulidæ, *Leach.*

GENUS. LIBELLULA, *Auct.*

LIBELLULA PULCHELLA. Thorace villoso olivaceo, lineolis duabus sub alis, abdomine (♂) cæruleo lateribus luteis; alis hyalinis maculâ baseos fasciâ mediâ apiceque fuscis. (Expans. Alar. 3 unc. 6 lin.)

SYN. Libellula pulchella, *Drury, App. vol.* 2. (1773.)
Libellula bifasciata, *Fabr. Ent. Syst.* 2. 374. (1793.)

HABITAT: New York.

Front of the head green. Eyes brown, large, and placed close together; behind each are two yellow spots, one round, the other oblong. Thorax hairy, and of a dirty brownish green; having on the sides two long yellow spots placed obliquely above one another, the under one being the shortest. Abdomen flattish, but triangular; in the male blue, but in the female yellow. Legs black. Wings transparent, with a small brown cloud on the tip of each; from whence issues along the anterior edge, a slender black stroke near the middle of each wing. Another small brown cloud begins on the anterior edge, and reaches about two-thirds cross the wing. At the base of each, also, a third dark cloud of a longish form seems to extend from the body near the anterior edge, to almost a third part of the wing. Between these clouds the males have a remarkable white patch or spot on each wing, and also another on the abdominal edge of the posterior ones, all which are not to be discerned in the females.

LOCUSTA (RUTIDODERES) SQUARROSA.

Plate XLIX. fig. 1.

ORDER: Orthoptera. SECTION: Saltatoria. FAMILY: Locustidæ (Acridites, *Serv.*).

GENUS. LOCUSTA. Gryllus; Sect. Locusta, *Linn.* Gryllus, *Fabr.* Acrydium, *Latr.* (SUBGENUS. Rutidoderes, *Westw.* Acrydium, *Serv.*)

LOCUSTA (RUTIDODERES) SQUARROSA. Viridis, pronoto tripartito spinoso, elytris viridibus fusco-punctatis, alis rubris nigro punctatis. (Expans. Alar. 4 unc.)

SYN. Gryllus Squarrosus, *Linn. Mant.* 538. *Fabr. Ent. Syst.* 2. 52.

HABITAT: Sierra Leone.

Head green. Eyes perfectly round and dark brown, very prominent, and standing at a little distance from each other. Antennæ 18-jointed, longer than the thorax, which is dark green, and on the upper part gibbous; having on each side three swellings, each of which terminates in three short and thick spines. Tegmina darkish green, with a great number of small black spots on them of different shapes. Wings scarlet, spotted with black; the spots being larger than those of the wing-cases, and of different shapes. Abdomen green, with several yellow rings surrounding it, and about the same length as the tegmina. Legs green; the thighs being armed with spines.

Our author states, that he was informed by a gentleman who lived several years at Sierra Leone, and by whom this species was communicated to him, that "they appear about the end of June, and soon afterwards retire among the branches of the palm trees, where they reside till the violent rains compel them to quit that situation, and live among the plants, &c. on the ground." In the Introduction to the third volume, he however states on the authority of Mr. Smeathman, that "this beautiful locust is an inhabitant of the sandy plains, called Savannas, which indeed abound with palms; but my friend is in doubt whether they have any kind of predilection for those trees.

"'Although the hot climates abound in every part with insects of the locust and cicada kinds, insomuch that their chirping, particularly that of the cicadas, becomes in some instances intolerable; yet in the sandy plains before mentioned, which are thinly covered with grass, their numbers are immensely greater, and of various kinds, sizes, and colours, skipping or flirting about in all directions at every step of the traveller.' Perhaps, indeed, their kinds may not be so various as one would at first imagine, the same insect differing so much from itself in the various periods of its life. From the fact however here mentioned, it seems most certain that these insects breed under ground in Africa, as well as in these climates, according to Linnæus and other entomologists."

From the knowledge which we possess at the present time relative to the economy of this tribe of insects, it is necessary to observe, upon the last above-quoted passage, that the term "breeding under ground," must be restricted to the mere circumstance of the eggs being buried beneath the surface of the earth, because the insects in all their active stages (including that of the pupa) feed upon grass and other vegetable substances above ground.

In following up the very proper plan proposed and partially effected by Mr. Kirby, in the Zoological Journal, of restoring to the primary divisions of the Linnæan genus Gryllus the names which he gave to them, and which have been so confusedly employed by Fabricius and the French entomologists, and of which I have elsewhere given a more complete explanation, it is necessary that the generic name Locusta should be restored to the true migratory locusts composing the genus Acrydium of Latreille, and that a new name (Rutidoderes) should be given to the subgenus Acrydium of Serville, comprising the present and other allied species.

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LOCUSTA TARTARICA?

Plate XLIX. fig. 2.

ORDER: Orthoptera. SECTION: Saltatoria. FAMILY: Locustidæ (Acridites, *Serv.*)

GENUS. LOCUSTA. Gryllus; Sect. Locusta, *Linn.* Gryllus, *Fabr.* Acrydium, *Latr.* (SUBGENUS: Locusta. Œdipoda, *Serville.*)

LOCUSTA TARTARICA. Thorace subcarinato tripartito; fusco, lineâ dorsali pallidâ; elytris fulvescentibus fusco punctatis, alis hyalino subvirescentibus. (Expans. Alar. 4 unc. 6 lin.)

SYN. Gryllus tartaricus? *Linn. Syst. Nat.* 1. 2. *p.* 700. 42. *Fabr. Ent. Syst.* 2. 53. *Serville Revis. Orthopt. p.* 92. (Acryd. 1.)
Gryllus americanus, *Drury, App. vol.* 2.

HABITAT: Virginia, Antigua, New York, Madras, and Sierra Leone (*Drury*). "Tartaria et Africa." (*Linn.*)

Head striped with dark and light brown. Eyes oblong. Thorax dark brown; having a light brown stripe running along it from the front of the head, which, when the wings are closed, is continued along the margin of the tegmina; on the sides it is light brown, and margined beneath with stripes and spots of dark buff. Antennæ thread-like, and about the length of the thorax. Tegmina dark buff-coloured, almost transparent, variegated with stripes and spots of different shapes; those next the shoulders being nearly black, and those toward the extremity more transparent. Wings very thin, and more transparent than the tegmina, being of a greenish hue. Abdomen light brown on the sides; having a small stripe of a paler colour running along it, and on the upper ridge is black. Legs pale brown. Hinder thighs almost square, the outer sides being white and prettily chequered, which, when viewed by a magnifier, seem like scales laid over one another; on the outside of the tibiæ is a round white spot, and over that a long black one. Posterior tibiæ brownish red, with two rows of spines on the hinder sides of a white colour, and tipped with black, consisting of nine in the outer and eleven in the inner row.

The different habitats given of this insect by Drury, leads to believe that he had confounded several closely allied species under one name, Americanus; which I should have adopted, but for its inapplicability for the individuals of the Old World. It is also on the like account that I have given the reference to Linnæus with doubt, although Fabricius cites Drury's figure under Gryllus tartaricus without any hesitation.

EMPUSA PENNICORNIS.

Plate L. fig. 1.

ORDER: Orthoptera. SECTION: Cursoria. FAMILY: Mantidæ.

GENUS. EMPUSA, *Latr. Serv.* Gongylus, *Thunberg.* Mantis, *Fabr. Drury.*

EMPUSA PENNICORNIS. Capite subulato, prothorace longissimo, femoribus anticis fusco trifasciatis, alis virescentibus. (Long. Corp. 2 unc. 1½ lin.)

SYN. Mantis pectinata, *Drury, App. vol.* 2.
Empusa pectinicornis, *Fabr. Ent.* 2. 25. *Oliv. Enc. Méth. No.* 32. *Serville Revis. Orthopt.* 21. (nec *Linn. Syst. Nat.* 1. 2. 691. *No.* 10.)

HABITAT: Jamaica.

Head yellowish brown; the upper part terminating in a point like a strong spine. Antennæ strongly pectinated or combed, and about half the length of the thorax. Thorax long and slender, flat on the under side, and rounded at top. Tegmina very thin, green, and almost transparent; extending, when

closed, beyond the abdomen. Wings green, transparent, towards the tips brownish, being near the same length as their cases. Abdomen about the length of the thorax, and near the extremity three times its breadth. Fore legs brownish yellow, with dark spots on them. Trochanters terminating in a thick spine; femora on the outer side furnished with two rows of spines, and a deep groove between them, which seems formed for receiving the tibiæ when closed up, like as the blade of a razor is received in the haft. Tibiæ furnished at the extremity with a strong spine, bending inwards, from whence the tarsi arise. Middle and hinder legs furnished with two spines at the tips of the tibiæ, and at the tips of the femora with one; having four small membranes almost joining to them.

This insect has been considered by all writers as identical with the Linnæan Mantis pectinicornis; but as that insect is described by Linnæus as an inhabitant of China, and the former as found in Jamaica, I have thought it more correct to restore the name of pectinicornis to the Linnæan insect, and give that figured by Drury another denomination.

EMPUSA GONGYLODES.

Plate L. fig. 2.

ORDER: Orthoptera. SECTION: Cursoria. FAMILY: Mantidæ.

GENUS. EMPUSA, *Latr. Serv.* Gongylus, *Thunberg.* Mantis, *Fabr. Drury.*

EMPUSA GONGYLODES. Capite subulato, prothorace antice dilatato, trochanteribus anticis spinâ, femoribus quatuor posticis lobo terminatis. (Long. Corp. 3 unc. 4½ lin,)

SYN. Mantis Gongylodes, *Linn. Syst. Nat.* 1. 2. 690. 4. *Stoll. Mant. t.* 16. *f.* 58. 59. 61. *Fabr. Ent. Syst.* 2. 17. 17. *Serville Revis. Orthopt.* 21. *Roesel. Ins.* 2. *Gryll. tab.* 7

HABITAT: Madras (and Philadelphia, sed? *Drury).* Africa, Asia (*Fabricius*). East India *(Serville).*

Head yellow, exactly resembling the colour of a withered leaf, and inclining downwards; terminating at top in a spine, with a small membrane on each side. Antennæ short, and thread-like; about the length of the head. Thorax very slender, flat at bottom, rounded at top, and grooved on the sides; being about the length of the abdomen, exactly representing a twig of a tree, being furnished on each side next the head with a thin yellow membrane of an angulated shape. Tegmina yellow, about two-thirds the length of the abdomen; the edges are margined, and the principal tendons by which they are united to the body extend like the rib of a leaf from the base to the extremity; several other smaller ribs or tendons branching out from the first, make them the exact figures of the leaves of trees. Wings green and transparent, except on the anterior edges, and rather shorter than the tegmina. Abdomen yellow, broad towards the extremity, but where it joins the thorax it is narrow, terminating at the anus in a short point; having two smaller ones above it on the last segment but one. Middle and hind legs greyish brown, and shaped exactly like the twig of a tree; the former being furnished at the tips of the tibiæ with three small spines, and the latter with two; each of the femora has a single spine to it, and close thereto are placed three membranes; two on the fore part, smaller than that behind, which is circular and remarkably thin. Fore legs yellow, with brown spots or clouds on them. Trochanters flat and thin, and ending in a short strong spine, a little crooked. Femora broad, and on the outer side thick and hollow, with two rows of spines; but on the inner side very thin and smooth. Tibiæ joining to the shins, long and triangular; the under side being hollow, and furnished with two rows of

small teeth like hairs; the extremity terminating in a long sharp spine, from whence issue the tarsi. Middle and hind legs furnished with two spines at the tips of the tibiæ.

BACTERIA LINEARIS.

Plate L. fig. 3.

ORDER: Orthoptera. SECTION: Cursoria. FAMILY: Phasmidæ. (Spectra, *Latr.*)

GENUS. BACTERIA, *Latr.* Mantis, *Drury.*

BACTERIA LINEARIS. Obscurè fusca (viridis insecto viventi) pedibus gracilibus simplicibus. (Long. Corp. 2 unc. 4½ lin.)

SYN. Mantis linearis, *Drury, App. vol.* 2. *Gray Syn. Phasm. p.* 17. (Bacteria? l.)

HABITAT: Antigua.

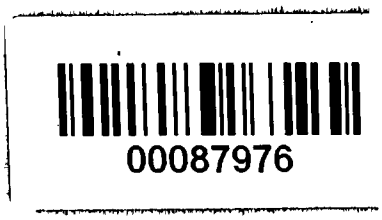
This insect resembles a parcel of straws united together, being entirely wingless, and is indeed, but incorrectly, stated by Drury to be the larva of an insect like that at Fig. 1. Its general colour, as he was informed, is green; but having received it in spirits, it had become of a dusky brown colour. Head small and long, reaching almost to the fore legs. Eyes round and black. Antennæ like hairs; being as long as the insect itself. Body, which extends from where the hinder legs are placed, consisting of nine segments, almost as long as the remaining part of the insect; those legs being fixed nearly in the middle, at a small distance from whence are placed the middle legs.

This insect belongs to a singular and numerous family, known to collectors by the names of Spectres, or Walking-stick insects; and others, Walking-leaves, from the strong resemblance which they exhibit to pieces of dried sticks and detached leaves.

The insect here figured appears to be in an immature state, and would probably in its final state have acquired wings. Our author appears to have been aware of this, but he incorrectly describes it as the caterpillar of an insect like that at Fig. 1.

END OF VOL. I.

G. NORMAN, PRINTER, MAIDEN LANE, COVENT GARDEN.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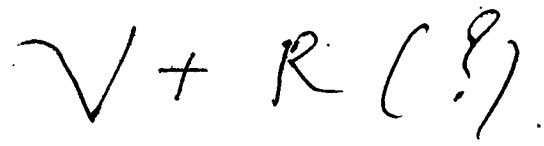

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